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Choosing Fruit Soils and Locations

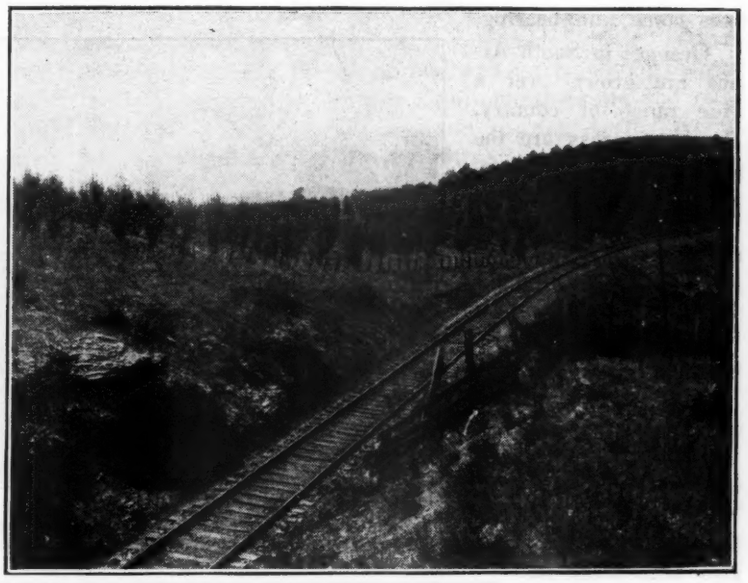
By T. J. TALBERT

WE CANNOT forecast a soil's productivity by chemical analysis, neither will an analysis of the plants grown upon soil give us a true guide as to what elements are required for best plant growth. The growing of plants in the soil under the environmental and climatic conditions is required to secure the knowledge needed as to growth and fruitfulness.

All soils were perhaps formed by the disintegration or breaking down of rocks under the slow action of atmosphere. Some soils remain upon the rocks from which they were formed; others have been removed to remote places. A good example of the removal of soil is that of the washing of hillsides. The water of rain and snow may carry the top soil to the bottom lands below. Sometimes the soil is carried by streams to great distances and deposited as sediment.

Fruit crops, in general, require the same qualities in a soil as garden, cereal, or forage plants. The growing habits of plants, however, are different. The character of the subsoil, its general physical condition, and the depth of the soil are usually more important considerations in the growing of tree fruit crops than in the growing of vegetable, cereal or forage crops. This is true because of the greater root depth and extension of tree crops. Fruit crops may show varying adaptations to soil requirements, yet practically all need for most profitable production considerable depth of soil, thorough aeration, and a freedom from hardpan, plowsole, and other impervious strata.

The amount of waste, timber and untillable land should be ascertained. Of this, estimates should be made regarding the amount made unfit for use by open ditches, swamps, rock outcrops and steepness of slope. Frequently the amount of land, which on account of its roughness, steepness, inaccessibility or some other reason, is great enough to bring the price of the tillable land to a high figure. This is a factor which should be given careful consideration, as the land which may be used in the culture of fruit crops may be so small that the price including the so-called waste land would make it prohibitive.



Above—A pear orchard showing very good soil and air drainage. Rock outcrops in the foreground indicate interference with tree growth at some points in the orchard. Below—This comparatively smooth and level orchard land affords a very good orchard site. The soil is fertile and well drained. Heavy cold air may move to lower levels without difficulty.

The selection of a suitable fruit soil is one of the most important problems confronting the fruit grower. Some problems of chief concern are the fertility, adaptation, ease of working, character of the subsoil, drainage of both soil and subsoil and whether the reaction of the soil is acid or alkaline. While the best soils are not necessarily required for profitable production, yet it would be a mistake to select the poorest or least desirable soil for a fruit plantation. Producers of fruit crops generally find that it is better to build the fertility of the soil before planting the fruit crops than to try to improve it after the crops are planted.

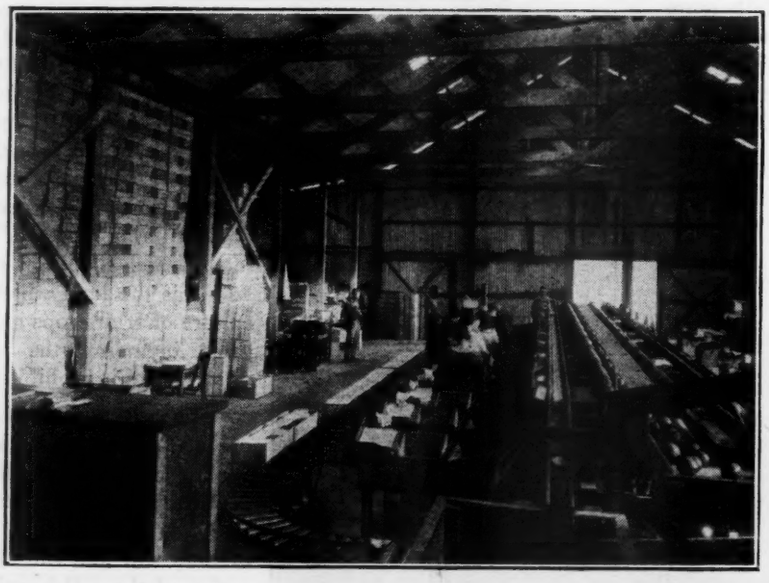
The adaptation of the fruit soil requires careful consideration. Certainly a type of *(Turn to Page 10)*

The South African

By H. CLARK POWELL

THE CITRUS fruit industry in South Africa has made much progress in recent years and at the present time is one of the most profitable branches of agriculture in South Africa. Exports of citrus fruits (chiefly Navel and Valencia oranges) have risen to nearly 2,000,000 boxes in 1931 from about 50,000 boxes in 1919. Still larger shipments will be made in the next few years as the trees become older and young trees come into bearing.

Oranges in South Africa are grown over a wide range of country. The chief areas are the western Cape Province, within 75 miles of Cape Town, the eastern Cape Province (Port Elizabeth and Grahamstown districts), western Transvaal (Koster, Marico, Zeerust, Rustenburg), northern Transvaal (Zebediela, Letaba), eastern Transvaal (Nelspruit, Barberton, Crocodile Valley) and Natal, along the Mooi River. Plantings have also been made in Southern Rhodesia and exports from there, of about 250,000 boxes, are included with South African shipments.



Above—Oldest orange trees in White River Valley Settlements. Below—Orange grading in White River Valley. Courtesy South African Railways.

When citrus fruits were planted on a large scale 10 to 15 years ago, it was assumed that no competition would be encountered in the English and Continental markets as the South African export season is from May to October, inclusive, during which time the large crops from Spain and Palestine are not available. That this assumption was erroneous can be seen from the fact that during 1931 California shipped 1,500,000 boxes of citrus fruits to the United Kingdom and to the same markets came 1,800,000 boxes from Brazil, all of this fruit being marketed during the South African season. In spite of this unexpected competition, there is every indication that the increasing crops from South Africa will be marketed with profit to the growers.

The two leading orange varieties in South Africa are the Washington Navel and the Valencia late. The Navel is notoriously a weak variety and to reach perfection and heavy bearing must have certain climatic conditions. Under suitable conditions it is a failure. Extensive planting of the Navel was carried out over a north and south range of 2,000 miles, from Cape Town to Southern Rhodesia; plantings were made at elevations from sea level to 3,500 feet above sea level; in areas subject to light winter frosts and in others where the lowest winter temperature rarely falls below 50 degrees Fahrenheit; under summer rainfall and under winter rainfall. Hardy varieties such as the Valencia or Mediterranean Sweet will succeed under a wide range of environmental conditions, but not so with the Navel.

The bulk of the Navels in the Transvaal and Rhodesia (about 1,000,000 trees) have proved very disappointing to the growers. Under the climatic conditions in the Transvaal and Rhodesia, with the exception of a few limited spots, the Navel can be considered as being a failure because of the combined effect of the following points:

(1) It is a shy bearer; (2) the average size of the fruit is too large; (3) it is more susceptible than other varieties to the attacks of thrips, false codling moth and Mediterranean fruit fly; (4) too large a percentage of the fruit must be culled for coarseness, mal-formations, etc.; (5) it is much more subject to decay in transit than other varieties.

In Natal and the Cape Province the Navel has been very successful, bearing good crops of fruit of unsurpassed quality.

Replacement of the unprofitable Navels with Valencias only would be unsound as this variety is late in

Citrus Industry

Professor of Horticulture
University of Pretoria

maturing and for any district to confine its plantings to a single variety would mean a comparatively short shipping season, with its numerous disadvantages. There is no orange variety in South Africa that matures as early as the Navel, which ripens in May in some districts. The nearest approach to the Navel in early ripening is the Mediterranean Sweet, a variety that is very successful in South Africa. It matures in June.

The average quality of the oranges exported from South Africa is not high but it has improved very much during the last few years and will show still further improvement. There is a considerable quantity of fruit exported that is badly blemished by thrips injury, although exterior markings are of less importance than juice content and sweetness. Some fruit that is coarse, dry, insipid or sour is shipped, although in decreasing proportion to the good fruit. The maturity test for oranges in California and Florida calls for a minimum ratio of eight to one for sugars and acid. The maturity test for South African oranges is much too low, the minimum sugar to acid ratio being 6.5 to one for Navels, 6.0 to one for Valencias and 5.5 to one for seedlings.

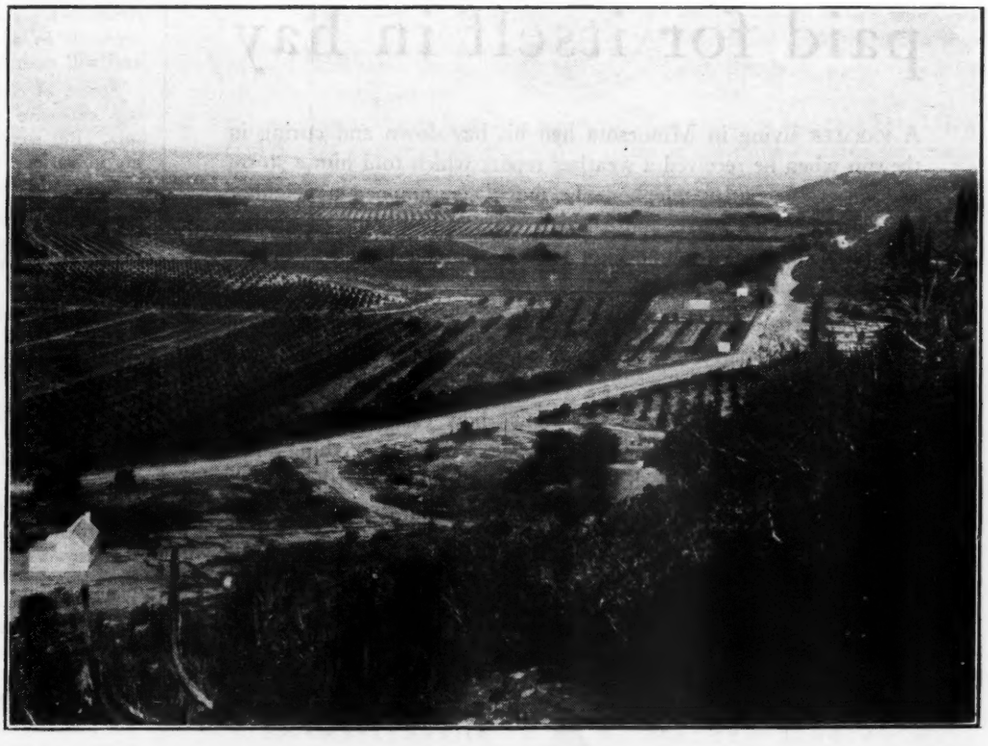
Valencias, on the whole, are of very good quality but in many instances they are shipped before they are sufficiently mature. Navels in Natal, the Cape Province and a few small sections of the Transvaal are of excellent quality and could scarcely be improved. South Africa can ship large quantities of very good oranges; the volume of exports is increasing and the average quality of the fruit is improving. Unexpected and severe competition from Brazil and California has been encountered but the writer is firmly of the opinion that the ever-expanding exports can be marketed with adequate profit to the growers who ship good fruit.

During 1931 the consumption of oranges in the United Kingdom (South Africa's principal market) was 70 per capita, exclusive of those used for marmalade manufacture. Of this quantity, 54 were used during the period when the large and cheap supplies from Spain and Palestine were available. During the period of May to November, the South African season, the per capita consumption of oranges in the United Kingdom was only 16. Although the summer consumption of oranges in the United Kingdom could probably never equal the winter use because of competing apples, pears, plums, peaches, berries and other fruits, it could certainly be raised materially above its present level.

When production of a perishable article increases substantially, there is normally no corresponding increase in consumption without a fall in wholesale and retail prices. The margin of profit accruing to the average South African orange grower is not sufficiently high to allow of any marked reduction in his returns, and if the increasing crops of the near future are to be marketed profitably in the face of severe competition from Brazil and California, it is imperative that the per capita consumption of oranges in United Kingdom during summer be increased by means other than through reducing prices.

A surplus of fruit, or an impending surplus, can be remedied or avoided by reducing the volume of fruit reaching the markets or by increasing the demand for the product, through advertising, at a faster rate than the increase in production. Some South African oranges can be kept from the markets by more rigid grading but, on the other hand, improved cultural practices and replacement of unsuitable trees will gradually increase the percentage of exportable fruit.

The average delivered cost of South African oranges in London (including growing, *(Turn to Page 12)*



"Kirkwood," Sir Lewis Richardson's Citrus Farm. Courtesy South African Railways.

Bankers Attest Stability of Fruit Growers

THE fruit growing industry as a whole has cause for rejoicing in these times of adversity. Along with all other commodities, foods especially, prices have been low, and at times have even given the growers scarcely their costs of production and marketing. Yet, fruit growers as a rule are solvent and in a position to maintain their orchards in a relatively high degree of efficiency.

AMERICAN FRUIT GROWER has ample evidence of the truth of these statements. In a recent extensive survey bankers, who are not given to overstatement, especially when matters of financial integrity are in question, have written the Editor of AMERICAN FRUIT GROWER in confidence their opinions of the fruit industry in various sections of the United States. Their views on this subject are enlightening; also, they prove again the statement that it is those who maintain their orchards by spraying, pruning and fertilizing, and who market their fruits by close grading and careful packing who are prosperous.

These growers have come through the period of depression in prices in good shape. They have continued the modern practices which have enabled them to produce quality fruit at low costs; they have marketed their products in a manner which brought higher than average prices.

Unfortunately, there are those in the industry who have not followed these practices. They have been, through necessity or carelessness, negligent about pruning; they have not sprayed as consistently as they would in times of higher prices and better markets; and, as a consequence, are not in such good financial condition as those who continued their practices even though conditions were discouraging.

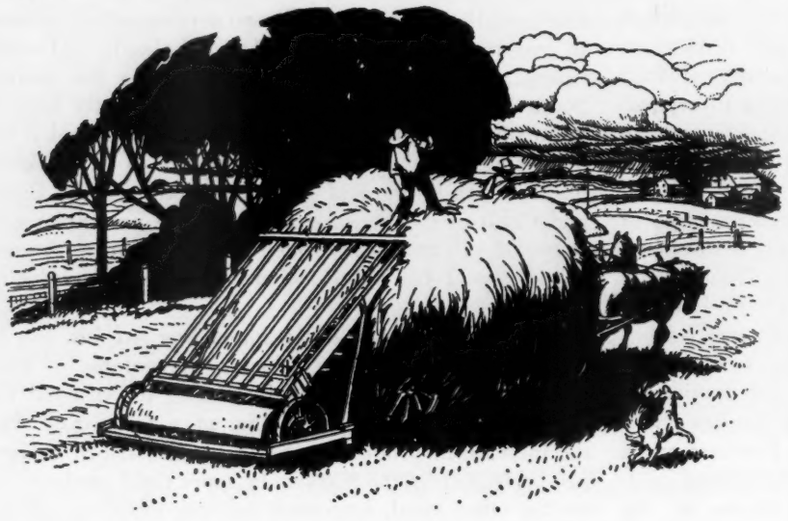
As one banker put it: "Those who have been in the business for many years, and have seen the ups and downs of prices, conserved their resources against such a time as this, and have a surplus to carry them over. These men are keeping their orchards in a high state of productivity, and will cash in when the turn comes."

Space, of course, does not permit printing extensive quotations from these letters. But some of the comments of bankers in various sections will prove interesting to readers of AMERICAN FRUIT GROWER.

California—"In our opinion the stability of the fruit growers here is much above the average, and with present reduced costs of labor and materials, a majority will have no difficulty." "Generally speaking there has been less financial distress among our citrus growers than any other farming class."

Florida—"Our fruit growers here are in a very good condition, financially. Over a period of 20 years they have received a fair price for their fruit, with the exception of the last two years, and are not at all discouraged." "Of course, some of the growers have not sufficient funds to care for their groves as they should, and some would not do it if they had sufficient funds, but a majority of the owners take care of their groves and are interested in growing a better quality of fruit."

New Hampshire—"I should say that the majority of fruit growers in this section are in a position to hold onto their farms until more favorable prices are se-



The telephone quickly paid for itself in hay

A FARMER living in Minnesota had his hay down and curing in the sun when he received a weather report which told him a storm was on its way. By telephone he quickly summoned a neighbor who dropped his work and rushed over to help out. Together they pitched into the job and got the hay into the barn just before the storm broke.

Several tons of fine alfalfa saved from the weather. In a single day this man's telephone had more than paid its way for a year or more.

Just such an incident as this shows how easily the telephone justifies its place in the farm home today, when everything must prove its worth in cold cash. But its value is almost without limit when you remember that it keeps you in intimate touch with the world. Today it may bring to you the news of a steady market or the well known voice of a neighbor—tomorrow transmit an emergency message to a doctor or a veterinarian. Figuring its worth is like trying to estimate the value of a close friend.

A BELL SYSTEM ADVERTISEMENT

cured. I am most optimistic about the future of fruit growing in this section."

New Mexico—"No crops here can be grown on unirrigated land. An orchard left unirrigated one year is practically lost. The orchards that have been cared for properly are in very good shape and their owners can continue to keep them in that condition, and will do so." "Fruit growers here will be able to continue, even on the basis of the present lower price levels. A superior fruit is grown, especially apples and they obtain a ready market."

Maryland—"Referring to the local financial conditions of fruit growers, I would say that most of them will maintain their orchards in good shape."

Georgia—"The peach growing industry here is on a fairly stable basis. The orchards here are better kept than in some localities, and I believe the lessons learned during the last few seasons have taught the necessity of growing good peaches on a much lower cost basis." "Fruit growers in ——— county are, for the most part, amply able to carry on."

Michigan—"In this section we find that many farmers own their places and have provided themselves with cash reserves that they can draw upon if necessary." "As I meet the best growers, who drop in at the bank, there is a hopeful attitude expressed. They are still maintaining their orchards by giving them the best of care, and are trying to use every economy."

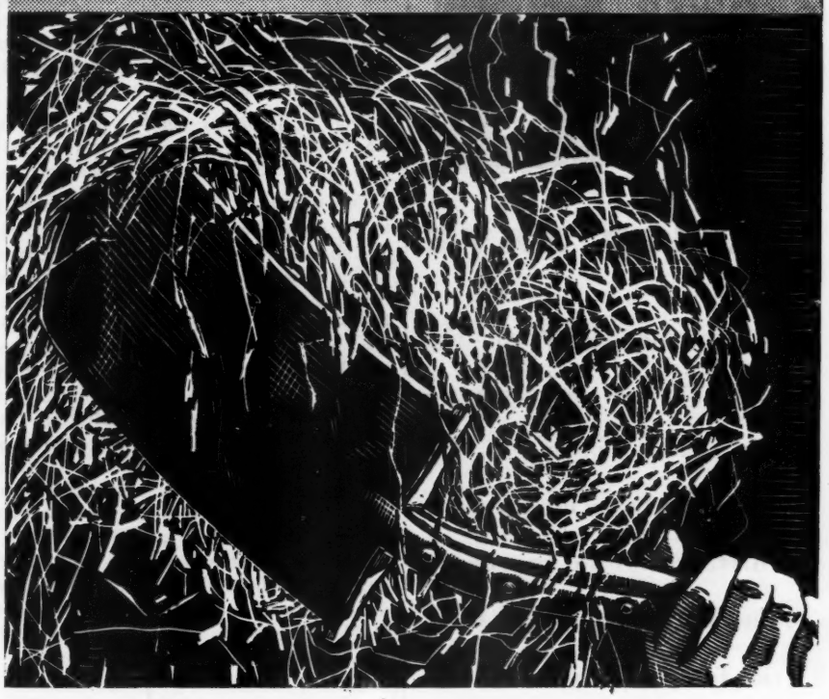
Indiana—"Practically all that are in the fruit growing business and have produced a quality product are in good shape. As you know, very few fruit farms are mortgaged. We have the soil, the climate, and growers with brains enough to adjust their operations to meet existing conditions." "Growers here, with one exception, are in fairly good financial condition. They are able to buy their supplies and pay cash for them."

New York—"We have a good proportion of growers in this section who are financially able to carry on and who know how to produce good fruit. However, there are some who have yet to learn the great importance of grading and packing. They are not in such a good position." "Fruit growers here are in a fairly strong position. These men have made money in the past and are quite firmly entrenched." "I have taken occasion to visit with some of our customers who are fruit growers, and believe that they will have no difficulty in carrying out their programs and will continue to show a reasonable profit in their business."

While only phrases have been quoted from a few of the letters received, these will show what bankers think of those in the fruit growing industry who manage their orchards so as to produce a quality product. And these hard-headed men, when it comes to extending credit, judge a great deal on a man's ability in his given line of business, in making their estimate of his ability to repay loans.

Fortunately, modern methods have come to be pretty much common usage in the fruit growing industry, and it is by these methods that conditions can be met.

THE *RIGHT* TOOL FOR PITCHING HAY IS A PITCHFORK



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YOU can load hay with a spade, but you can do a better and a quicker job with the right tool. The same thing is true in operating your car.

Ethyl Gasoline makes such an improvement in car performance that nearly every car manufacturer now sells high compression engines that *require* Ethyl. Older cars thank you even more for the *new* life Ethyl restores and for the *longer* life it gives by preventing harmful knock, overheating and power-waste.

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Many farmers find that Ethyl Gasoline is the right gasoline for trucks and tractors also. The saving it makes on engine-wear-and-tear, on less frequent carbon removal, and the extra work it gets done, more than offset its slight additional cost by the gallon.

In any gasoline engine, Ethyl Gasoline makes so great a difference that more people now use Ethyl than any other brand of motor fuel. And remember that today you can buy Ethyl for less than you paid for regular gasoline only a few years ago. Ethyl Gasoline Corporation, New York City.

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J. E. MARKHAM INTRODUCES FOUR NEW PEACHES

The cover picture represents a basket of "Bitterless Elberta" peaches, one of four new varieties developed by J. E. Markham, a nurseryman of Xenia, Ill. The Bitterless Elberta has been tried in many peach localities by commercial growers who speak highly of the new variety.

Prof. M. J. Dorsey, chief in pomology at the University of Illinois, writes as follows on Mr. Markham's new peaches:

"Mark-Berta: The Mark-Berta seemed to me to be the solidest of the group, although not very different from Vivid Globe in this respect. There was somewhat more color to the flesh at the seed in Mark-Berta than in the Bitterless Elberta, although that feature would not be objectionable for ordinary use. The thing that impressed me about the Mark-Berta was the solid flesh and high color, although the tree run of this variety may not differ very markedly from some of the others. The flesh of this variety, even in the extra ripe fruit, had the same general characteristics as to firmness that is so typical of J. H. Hale. That feature, it seems to me, would mean much from the standpoint of more distant shipments. I thought the quality of Mark-Berta was excellent, even though the specimen we had was a little ripe.

"Bitterless Elberta: The Bitterless Elberta seemed to have a tenderer flesh than the Mark-Berta and considerably less color at the seed. The golden yellow flesh of this variety, it seemed to me, was especially attractive. Personally from the specimens we have, I think I would place the quality of Bitterless Elberta somewhat above the Mark-Berta, although I would not want to decide on that point with so few specimens.

"Vivid Globe: The two specimens of Vivid Globe were very ripe. The unusual size of this variety would probably interest most any grower who is trying for some of the better grades. There was relatively little color at the seed in Vivid Globe and all told, while the flesh seemed tenderer than Hale-Berta and Mark-Berta, it is fine-grained and of high quality.

"Canadian Queen: I think Canadian Queen was more like the Bitterless Elberta in flesh characters. I am of the opinion that the high quality of this variety will make a place for it. It is fine-grained, golden yellow and although the flesh characters seem firm, nevertheless, they are not quite as firm as the Hale. I would like very much to have seen the entire crop of Canadian Queen this year."

MAKING SULPHONATED LINSEED OIL

By R. B. HARVEY

The horticulture department, Minnesota Agricultural Experiment Station, has made a survey of substances which might be used to keep rabbits from eating the bark from apple and plum trees. Concentrated lime sulphur solution sprayed or painted onto the trees was quite effective Blood painted on the bark was a good repellent. But these will be washed off by rains and must be renewed. A solution of rubber in oil was tried, but it was not smelly enough. We then tried mixing sulphur (1 part) with linseed oil (9 parts) and heating. The oil and sulphur react chemically, producing a sulphonated oil which has a rubbery consistency. It has a strong, disagreeable odor and has fine lasting qualities. It can be diluted with linseed oil and high test gasoline free from anti-knock chemicals.

This sulphonated oil has been tried on a block of 1,200 apple and plum trees in a place infested with rabbits and seems to be a good repellent. The sumac, dogwood, oak and other shrubs surrounding this orchard were badly eaten by the rabbits, which had free access to the protected apple trees. Rabbit tracks were thick in the orchard, yet the trees were well protected. In tests with rabbits confined in a wire enclosure and given nothing else to eat, rabbits ate first the controls which had no treatment, then attacked those treated with blood, and then concentrated lime sulphur. The sulphonated oil was attacked last, and then only limbs were nibbled. When the rabbits had become very much starved, one rabbit began eating the bark treated with sulphonated oil. It died the next day, whether from effects of weakening from starvation or from the effects of the oil on the kidneys could not be determined.

With the sulphonated oil can be combined cayenne pepper, strychnine, copper soap, and other poisons, but the principle of using an odoriferous repellent is best since it avoids injury to the bark. The oil forms a tough, protective covering over wounded tissues.

Take one quart of raw linseed oil. Do not use boiled oil. Heat it to 470° F. outdoors where no fires will be started from accident, because the oil may foam over. Use a container five times as large as the volume of oil. It is best to use a thermometer so that the temperature is definitely known. The oil will give off a slightly bluish smoke at that temperature. Remove the container from the fire when 470° F. is reached, and set it at a distance away from the flame. Immediately begin the addition of flowers of sulphur before the oil has time to cool. Add the finely-powdered sulphur a teaspoonful at a time, and stir the oil thoroughly after each addition. The oil will get somewhat hotter and will foam badly. Add three ounces of the sulphur to each quart of oil. When the sulphur has all been added, the oil should

XUM

be black and thick, with an obnoxious odor. Do not get it onto the clothing because its odor is very persistent. It will not injure the hands and can be washed off with soap and water, or dissolved by gasoline.

The thick sulphonated oil is just about the right consistency to paint onto tree trunks. Paint a liberal coating onto the tree, reaching a couple of feet above the snow line and down to the ground. If it drops onto the ground around the tree, it is all the better for preventing mice from digging to below the protected bark.

Dilute the oil with high test gasoline free from lead. If the oil is diluted with gasoline so as to spray it onto the trees with an oil sprayer, use as little gasoline as possible. We have found no injury to the bark from gasoline dilutions. Turpentine will cause injury where there were cracks or rabbit injuries already. If there is injured bark, there may be a zone about a quarter of an inch back from the wound that will be killed after a few months, evidently by the turpentine. About 700 trees may be sprayed in four hours with a good oil spray gun. It is best to paint the undiluted sulphonated oil onto the trees with a brush unless a large number need to be protected quickly. It is best to work on warm days in late autumn before the tree bases are covered by snow. The trunks should be dry when applying the oil. The protective covering remains over winter, but if rabbits are very thick and other forage is scant, it is desirable to apply a second coating at some suitable time during the winter. No objectionable features have been discovered after a year's application of this preparation, and it seems to be the most effective repellent. The rabbits do not have to eat the bark to get the effect, as is necessary with strychnine. Poisons can be incorporated in the oil to kill rabbits which nibble at the bark only if the State laws permit.

A water emulsion of sulphonated linseed oil can be prepared in the following manner:

Heat one gallon of sulphonated linseed oil to about the boiling point of water (212° F.). Dissolve in this one-half pound of stearic acid (obtained at drug stores and chemical houses).

Heat two gallons of water to boiling and add one-third pound of triethanolamine (a liquid obtainable from the Carbide and Carbon Chemical Co., New York). Mix these solutions when they are both at the boiling point of water (212° F.) by stirring thoroughly. A rather thick emulsion will be formed, which should have very fine globules of oil. Stir this until it is cold. Then it can be sprayed with the usual knapsack sprayer or a power spray outfit. If the oil emulsion proves too thick, it can be diluted still more with cold water, but adding too much water will cause the emulsion to break. The emulsion must not be allowed to freeze. It is best to apply the rabbit repellent on warm days after the leaves have fallen.

There are 43 foreign countries and six states in the United States that produce citrus fruits.

Extreme Test Proves Value of Oil Spray

DECISIVE proof of Dendrol's greater killing power of scale was furnished this year in commercial orchards.

Fruit trees in many parts of the country last winter were threatened with one of the most severe infestations of San Jose scale. Urgent warnings went forth from State Experiment Stations. Many competent observers questioned whether available spray materials could control the infestations because of the vitality exhibited by insects.

In a Middle West orchard, San Jose scale infestation was so serious that there was imminent danger trees would be devitalized, and the crop damaged. Dendrol was applied thoroughly. Careful examination this summer revealed 100% kill of scale. In another locality, four orchards provided a striking test. Three of them had been sprayed each year with Dendrol. Inspection at harvest found no scale-specked fruit. In the fourth orchard, where conditions were similar and comparable, and where a non-oil spray was applied, a dangerous proportion of scale survived and injured the fruit.

To prevent scale gaining a foothold in your orchard, and later impairing the quality of your fruit, spray this season with Dendrol either in the dormant or delayed dormant period. With Dendrol you can also control red mite, and other insects that winter on plant life.

Make sure that you have a supply of Dendrol by ordering it now. Authoritative recommendations for using it appear in the Dendrol Booklet. Write for your free copy to

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Stability insures uniform coverage. If the oil is not stable, that is, separates in the tank, as often happens with homemade emulsions, too much oil may be sprayed on some trees, resulting in injury, and not enough on others to kill the insects present. A stable mixture, such as is obtained with Dendrol, enables you to give every tree the same proportion of oil.

Quick "breaking" is what forms the oil film. The tiny globules of oil in the spray, "breaking" from the emulsion as soon as the spray hits the bark or insect, run together to make a smooth, continuous coating of oil. The oil does not run off; it sticks.

This nice balance between stability in the spray tank and quick breaking when the spray strikes the bark or insect, is to be had only when you use Dendrol.

Dendrol also has maximum spreading and penetrating power. It is light enough to creep under scale covering and penetrate the insect's breathing pores, and heavy enough to spread a film or seal over those vital air-inlets.

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NEW YORK

Choosing Fruit Soils and Locations

(From Page 3)

soil should not be selected where an impervious hardpan is within a few inches of the top soil, where ledges of rock may be found within eight to 12 or 14 inches of the top soil, or where other conditions prevail in the soil or subsoil that are likely to be unfavorable to plant growth.

Certain varieties or groups of fruits may show quite distinct soil preferences. Some fruit trees have been found to be very sensitive to a lack of subsoil moisture or an over-abundance of it. Other fruits may show a preference for light or heavy soils, and there may be a few that are decidedly exacting. Much evidence tends to show, however, that the tendency now is to place less importance upon the soil requirements of different fruit crops.

It is important that the soil be easy to work. This will facilitate cultivation and cut down the expense of caring for plants before they come into fruiting. The response of the soil to fertilizers of the various kinds should be given consideration. With very open or porous soils, such as may be had by the selection of coarse gravel or coarse sand, there is less likelihood of the soil being retentive of moisture; while, on the other hand, a tight or more or less impervious clay soil may give the grower trouble as regards to soil drainage, particularly during rainy seasons.

While the subsoil is not as important as the top soil, yet in some instances it may be equally as valuable in the production of profitable fruit crops. The prospective planter may study the character and physical structure of the soil and subsoil by observing ditch banks and by inspecting the banks and highway cuts. It is important that the subsoil be of such a nature as to be easily penetrated by the roots of fruit crops and that it also supply good water drainage. The grower cannot improve the subsoil a great deal as regards to making it more fertile or more porous, yet he should be vitally interested in it because a very large portion of the root system of fruit trees is found there.

Water drainage and aeration may be an important problem, particularly on steep slopes and on lands that have a tendency to wash badly. Level lands or gentle slopes are less likely to give serious problems in erosion. Where the slopes are very steep the water after a rain may run off before it has time to soak into the soil. Furthermore, steep slopes are almost sure to cause fruit crops to suffer during drought periods due to a lack of moisture.

The natural soil drainage deserves careful consideration. It may be found that for best soil handling and increased production some artificial drainage may be needed. Where artificial soil drainage is not required a considerable saving may be made.

Most good fruit growers recognize the fact that good air drainage is required for profitable results in fruit production. This does not mean that we must locate the orchard on the highest ground or the steepest slopes. In general, for the best results, sloping ground should be selected which will allow the air to move from the orchard to lower levels without difficulty. Good air drainage, therefore, may be had on comparatively low lands if they supply facilities for air movement. It should be understood, also, in this connection that the lower ground is generally more fertile as a result of the washing of soil from above, and the soil is deeper. As a result, such soils may increase production by growing fruit plants of great size and longer life.

In the selection of a location for fruit growing, the physical condition of the soil and its fertility should be given careful consideration. If the location affords various different soil types, advantages may be obtained through differences in the ease of tillage and in the growing of varying types and ages of fruit crop plants. Sandy loam and light sandy soils are generally well drained and can be tilled soon after rains and worked early in the season. These conditions may facilitate cultivation during the growing season and reduce the cost of labor and finally the cost of production. Such soils may be comparatively low in fertility but they usually respond readily to manure and commercial fertilizers.

It may be advantageous to describe the ideal fruit crop soil, although few producers are likely to possess it. They may approximately attain it by practicing the best soil handling methods. Having in mind the ideal, the producer may be able to develop and maintain soils adapted to profitable fruit production.

A deep, well-drained, fertile, loam soil supplied with an adequate amount of organic matter is generally believed to be well suited to the growing of fruit crops. Such soils are generally retentive of water and mineral nutrients. By the term "deep" is meant a top soil of a depth of from 12 to 20 inches. This should be underlaid with a fairly porous subsoil which will give proper drainage and aeration and permit the growth and extension of roots to a depth of from four to five feet to as much as eight or 10 feet or more.

The State agricultural experiment stations and the United States Bureau of Soils have made extensive soil tests and have issued maps and publications showing and describing soil structure. For the particular area in question these may usually be obtained for the asking. Such information should be of great interest and value in a consideration of fruit soils and locations.

We Want Your Help

If you move, write us at once, giving your old and new address. This will enable us to send AMERICAN FRUIT GROWER to your new address, and will insure your getting it promptly. Do not delay. Send your old and your new address to AMERICAN FRUIT GROWER, 1105 Merchandise Mart, Chicago, Ill.

October Fruit Crop Comments

The October 1 forecast of the total apple crop is placed at 133,824,000 bushels which represents a decline of about three per cent from the September 1 forecast.

The greatest declines from a month ago took place in Virginia, where drought conditions prevented proper sizing of the fruit with consequent losses in volume, and in Washington, where prospects declined as a result of heavy worm damage and small size. Cullage in order to meet grade requirements will run heavy in the entire Northwest due to late worm infestation.

As the commercial crop is taken to represent only that portion of the total crop available for sale as fresh fruit, the small sizes and worm damage have caused a greater relative loss in commercial prospects than in the total crop. Added to these factors, Washington State has placed a restriction on the shipment of low grade fruit; all of which combined to reduce the prospects for commercial fruit about six per cent from the figure a month ago. The commercial crop is forecast on October 1 at 27,908,000 barrels as compared with 34,592,000 barrels in 1931.

The preliminary estimate of peach production in 1932 is placed at 46,267,000 bushels, which is but slightly changed from the forecast on September 1 and, in fact, varies only about two per cent from the forecast as far back as July 1.

The October 1 indicated production of pears in 1932 is but little changed from the figure last month. The crop is now placed at 22,154,000 bushels, or about 95 per cent of the crop produced in 1931 and about 86 per cent of the large 1930 crop.

The first quantitative forecast of citrus production is made on October 1 for Florida. The 1932-1933 orange crop in that State is indicated at 14,300,000 boxes for the total production and 11,800,000 boxes the shipping crop. This compared with 13,800,000 boxes the revised total and 11,200,000 boxes the revised commercial crop of 1931-1932. Grapefruit production now promises to be around 9,200,000 boxes for the total crop and 6,700,000 boxes commercial in 1932-1933, as compared with 10,200,000 total and 7,700,000 commercial in 1931-1932.

Scientists Develop "Shatterproof" Grape

"Shatterproofing" grapes is one of the latest accomplishments of scientists of the United States Department of Agriculture and one which may save grape growers of the United States thousands of dollars annually.

Shippers lose large sums yearly from grapes which "shatter" or break from the stem in transit. Dr. Charles Brooks of the department has discovered in laboratory experiments that subjecting the grapes to carbon dioxide gas before they are placed in the refrigerator car prevents much of this shattering. He has applied for a public-service patent which will make the method free for anyone to use.

No one can make a good drink out of poor Coffee

You can get no finer coffee flavor in the cup than is in the coffee you buy. But there is one coffee you can always depend upon to be "always" delicious, "always" rich and mellow and sparklingly fresh. That coffee is Beech-Nut. For Beech-Nut is finest mountain-grown coffee, scientifically blended and roasted — then protected by modern high-vacuum tins.

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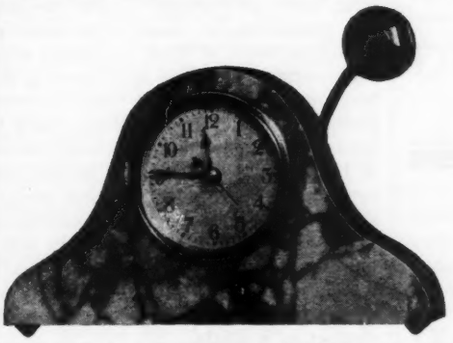

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THIS NO. 1300 model guaranteed Genuine Marble Clock has always sold at an established retail price of $12.50. You can order it today for $3.00 C.O.D. Notice—We can only take orders for the number of clocks now in stock—Order at once—If you do not receive a clock you understand your order came too late.

No. 1300 is made in Belgium Marble. Height 4"—Width 7½"—Dial 2½". Be sure to advise whether you want key wind or electric movement. Electric synchronous movements for 110 volt alternating current of 60 cycles frequency only. Make: Brach or New Haven Westinghouse. Key Wind—New Haven Spring Movement.

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The South African Citrus Industry

(From Page 5)

packing, shipping and selling charges) is about 15 shillings a box ($3.75 at par) and the delivered cost of Spanish and Palestine oranges is about 12 shillings a box ($3 at par), exclusive of the new 10 per cent tariff. The delivered cost of California oranges is about 20 shillings a box ($4 a box at the present rate of exchange), to which must be added the new duty of 10 per cent. A reduction of average South African orange prices to average Spanish or Palestine levels would undoubtedly result in a greatly increased use of South African oranges, but such a reduction in returns could not be borne by the growers because of their comparatively high production and marketing costs. The road to increased use of South African oranges, therefore, lies in advertising to stimulate the demand at present prices.

If every grower were to export his fruit under his own brand, advertising would be impossible because no single brand would be large enough to cover the costs of advertising. At the present time, some 700 brands of oranges are exported from South Africa. A national brand for South African oranges cannot be created because the quality and character of fruit produced in the widely scattered citrus areas is extremely variable, owing to differing climatic conditions. The creation of district brands is quite feasible and steps must be taken to form such brands in order that the necessary advertising can be made possible.

Numerous local co-operative associations of growers exist in South Africa, each shipping from 50,000 to 500,000 boxes of fruit under one or two brands. A volume of 200,000 cases of oranges is not enough to carry the overhead charges essential to large scale advertising. If five co-operative companies, for example, representing a million boxes of fruit of similar character, were to combine and create a district brand for their best fruit, a certain amount of consumer advertising could be done. Trade advertising, through the use of trade journals and dealer service men, can and is being done by some existing co-operative companies but advertising of this nature, while of great value in inducing the trade to buy and push a particular brand, is of relatively little value in increasing the per capita consumption of the product as a whole.

Certain areas in South Africa, such as the northern Transvaal, western Transvaal, eastern Transvaal, Natal and the eastern Cape Province, produce within themselves a comparatively large volume of fruit of uniform quality and appearance. If several co-operative companies in a section producing fruit of uniform quality were to combine to ship their best fruit under a district brand, the volume of fruit under the brand would be large enough to carry the costs of advertising the brand to the general public along the same lines followed by the California Fruit Growers Exchange in advertising "Sunkist" oranges, lemons and grapefruit.

Each co-operative company would retain its own brand (there are usually two) but in addition the brand for the best fruit would carry the district brand, incorporated with the box-end label or superimposed on it. Fruit coming up to the quality requirements of the district brand would be stamped with that brand and each wrapper would be printed with the district brand. Thus, the fruit would be sold to the trade on the basis of the local co-operative company's brand and advertised and sold to the consuming public on the basis of the district brand. There would be no pooling of returns between the co-operative companies, each company receiving the money realized from the sale of its own fruit, less advertising costs.

If a particular company joining a district association should have fruit somewhat better than the fruit of other members, it would lose nothing by its association with the other companies. The requirements of a district brand would be minimum requirements of quality and appearance. If the fruit of any company were to be farther above the requirements than that of other companies, the trade would naturally pay a premium for it, as usual, because the local brands of the associated companies are retained under the plan outlined above.

At the present time, conditions are very promising for South African orange growers in spite of the poor economic situation in England and on the Continent. Brazilian and Californian fruit is subject to the new 10 per cent tariff imposed by Britain on fruit and various other articles imported from sources outside the British Empire. South African products are exempt from this tariff. The exchange disparity between the United States and Great Britain imposes a great handicap on California shippers and this, plus the 10 per cent tariff, will mean greatly reduced fruit shipments from California to the United Kingdom during 1932.

South Africa is on the gold standard but exporters are subsidized to the extent of two shillings (50 cents) a box in the case of oranges and this partially offsets the exchange loss on remittances from sales of fruit in Great Britain.

Brazilian orange experts (which coincide with those from South Africa) are increasing rapidly and per capita consumption of oranges in the summer months in Britain must be increased if the South African citrus industry is to be continued on a profitable basis. As has been pointed out, there is great scope for such an increase and it can best be done through extensive advertising, achieved through closer co-operation of the citrus growers of South Africa.

It pays to keep farm implements and machinery not in use under shelter.

The Culture of the Orange and Allied Fruits

H. CLARK POWELL
Professor of Horticulture
University of Pretoria
South Africa

An important work which deals in an exhaustive and authoritative manner with all problems and aspects of the subject. It is invaluable to students, growers and teachers in all areas where citrus fruits are grown.

The writer has had wide experience in California and South Africa and from 1927-29 was engaged in a survey of citrus fruit possibilities in Palestine, Cyprus, Jamaica, British Honduras, British West Indies, California, Florida and West Africa for the Empire Marketing Board, England.

California Citrograph — "The reviewer . . . . recommends it to the consideration of anyone even remotely interested in the fascinating field of citriculture."

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The scope of the book is indicated by the headings of the chapters—

Chapter I, The Origin, Spread and Commercial Significance of Citrus Species; Chapter II, Citrus Varieties; Chapter III, The Citrus Nursery; Chapter IV, Establishment of a Citrus Grove; Chapter V, Bud Selection and Records; Chapter VI, Citrus Root Stocks; Chapter VII, Fertilizers and Manures; Chapter VIII, Cultural Operations—Irrigation, Cultivation, Alkali, Pruning, Top-working; Chapter IX, Judging Citrus Fruits; Chapter X, Picking and Packing Citrus Fruits; Chapter XI, Marketing and Organization; Chapter XII, Some Common Citrus Diseases and Their Control; Chapter XIII, Citrus Insect Pests and Their Control Through Fumigation and Spraying; Chapter XIV, Citrus Growing in the West Indies and British Honduras; Chapter XV, The Citrus Industry of Palestine and Cyprus; Chapter XVI, The Citrus Industry of Florida; Chapter XVII, The Citrus Industry of California; Bibliography.

The book can be obtained, post free, for $5.25 from—

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COMING MEETINGS OF FRUIT GROWERS

DELAWARE, Peninsula Horticultural Society meeting will be held in Grange Hall, Camden, November 30 to December 2.—**J. F. Adams, Secretary, Box 425, Newark, Del.**

IDAHO State Horticultural Society meeting will be held at Boise, January 10 to 12, 1933.—**W. H. Wicks, Secretary, Boise.**

ILLINOIS. Northern Illinois Horticultural Society annual meeting will be held in Nelson Hotel, Rockford, December 1 and 2.—**H. W. Curtiss, Secretary, Stockton.**

IOWA State Horticultural Society sixty-seventh annual convention will be held in connection with Ninth Mid-West Horticultural Exposition in the Coliseum, Marshalltown, November 15 to 20. Conventions of several affiliated societies will also be held at this time.—**R. S. Herrick, Secretary, State House, Des Moines, Iowa.**

KANSAS State Horticultural Society annual meeting will be held in State House, Topeka, December 7 and 8.—**Charles A. Scott, Secretary, Topeka.**

KENTUCKY State Horticultural Society annual meeting will be held in the Live Stock Pavilion of the University of Kentucky, Lexington, first week of December.—**Ben E. Niles, Secretary, Henderson.**

MASSACHUSETTS Fruit Growers' Association meeting will be held in the State Armory, Worcester, January 4 to 6, 1933.—**William R. Cole, Secretary, Amherst.**

MICHIGAN State Horticultural Society annual meeting will be held in connection with Michigan Apple Show in Waters Building, Grand Rapids, December 6 to 8.—**H. D. Hootman, Secretary, East Lansing.**

MINNESOTA State Horticultural Society annual meeting and exhibit of apples, flowers and vegetables will be held in Northwestern National Bank Building, Minneapolis, November 28 to 30.—**E. S. Mackintosh, Secretary, University Farm, St. Paul.**

MONTANA State Horticultural Society meeting will be held in Hamilton in December.—**W. E. Pollinger, Secretary, Corvallis.**

NEBRASKA State Horticultural Society meeting will be held in Plant Industry Building of College of Agriculture, Lincoln, January 3 to 5, 1933.—**E. H. Hoppert, Secretary, Lincoln.**

NEW JERSEY State Horticultural Society annual meeting will be held in Haddon Hall, Atlantic City, December 7 and 8.—**Arthur J. Farley, Secretary, College Farm, New Brunswick.**

NEW YORK State Horticultural Society seventy-eighth annual meeting will be held at Edgerton Park, Rochester, January 11 to 13, 1933. Eighty-five thousand square feet floor space for fruit and commercial exhibits. Three-day speaking program on subjects concerning the apple industry. Banquet for future fruit growers.

Eastern meeting of society will be held in State Armory, Kingston, N. Y., January 25 to 27, 1933. Three-day program. Fruit and commercial exhibits. Banquet for boys.—**Roy P. McPherson, Secretary-Treasurer, LeRoy.**

OKLAHOMA State Horticultural Society winter meeting will be held in Huckins Hotel, Stillwater, January 11.—**George W. Cochran, Secretary-Treasurer, Stillwater.**

OREGON. Western Nut Growers' Association winter meeting will be held in Chamber of Commerce Building, Salem, December 6 and 7. One-half day on December 7 will be devoted to a joint meeting with the Oregon State Horticultural Society.—**C. E. Schuster, Secretary-Treasurer, Corvallis.**

PENNSYLVANIA State Horticultural Association winter meeting will be held in the South Office Building, Harrisburg, January 17 and 18, 1933.—**R. D. Anthony, Acting Secretary, State College.**

Northern Nut Growers' Association meeting will be held at Downingtown, Pa., September 11 to 13, 1933.—**Willard G. Bixby, Secretary, Baldwin, N. Y.**

TENNESSEE State Horticultural Society annual State-wide convention and fifth annual apple show will be held at Jackson, November 17 and 18.—**G. M. Bentley, Secretary-Treasurer, 402 Morrill Hall, Knoxville.**

VIRGINIA State Horticultural Society meeting will be held in the Monticello Hotel, Charlottesville, December 6 to 8, convening at eight o'clock Tuesday night, the 6th.—**W. S. Campfield, Secretary, Staunton.**

WASHINGTON State Horticultural Society meeting will be held in the Chamber of Commerce, Wenatchee. Dates have not been definitely set.—**F. L. Overley, Chairman Local Arrangements, Wenatchee.**

WISCONSIN State Horticultural Society annual convention will be held in the Schroeder Hotel, Milwaukee, November 9 and 10. The Wisconsin Garden Club Federation affiliated with the society will hold its convention at the same time and place, with a separate program.—**H. J. Rahmlow, Secretary, Washington Building, Madison.**

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ANNOUNCEMENT

CLASSIFIED ADVERTISING RATE REDUCED. Effective with the next issue of AMERICAN FRUIT GROWER, the classified advertising rate will be reduced 25%—from 20c a word to 15c a word. The circulation remains the same. This is being done to assist classified advertisers to obtain even better results than ever before and to encourage a more liberal use of classified advertising in AMERICAN FRUIT GROWER. Only increased patronage of this department will justify this cut. If you, Mr. Classified Advertiser, want this low rate to remain in effect, send us your classified copy and order at once for the next issue. Inasmuch as many advertisers report satisfactory and profitable results at the higher rate, you will be almost assured of good returns at the new reduced rate of 15c a word. Think it over and send us your instructions now. Address Harry K. Goodall, C.A.M., American Fruit Grower, 1105 Merchandise Mart, Chicago.

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RELIABLE MEN AND WOMEN WANTED WHO are acquainted with fruit growing, to take subscriptions for the American Fruit Grower and our other farm and poultry papers. All or part time. Splendid opportunity to earn a satisfactory amount regularly. Others are doing it. You can too. Write 1105 (F-10) Merchandise Mart, Chicago, Ill.

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SALESMEN WANTED — MANY STARK SALESmen make more than $50.00 weekly during spare time. You can do as well. Pleasant outdoor work. No experience necessary. Big pay weekly. We furnish Big Sales Making Outfit FREE. Write at once for full information to Stark Bros. Nurseries, Box 1, Louisiana, Mo. 7

ATTENTION! FIFTY DOLLARS WEEKLY FOR your time. Take orders for high quality, ruggedly grown fruit trees, etc. New popular prices. Your own requirements at wholesale. Free outfit. Pay weekly. Burr Nurseries, Department J, Manchester, Conn. 9x

77 MILES ON 1 GALLON? NEW AUTO GASsaver—Oiler. 230% profits. One free. Gassaver, B-144, Wheaton, Ill.

SALESMEN WANTED TO SELL CANVAS FRUIT pickers' bags. The Barker Manufacturing Co., 276 Clinton, Avenue So., Rochester, N. Y. 7

SALESMEN — CALLING ON ORCHARDISTS TO carry Treesaver as side line. The Dayton Treesaver Co., Dayton, Ohio. 9-10

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EARN UPWARDS OF $20 WEEKLY GROWING mushrooms, all Fall and Winter, in cellars or outbuildings. Ready market. Begin now. Illustrated booklet free. Established 25 years. Adanac Mushroom Co., Dept. 139, Toronto 10, Canada.

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FOR SALE: FAMOUS STUART ORCHARDS, located at Marshall, Michigan. 150 Acres of extremely fine orchards in excellent condition. Approximately 5,000 trees. Average 10 years. Varieties: Northern Spy, Baldwin, R. I. Greening, N. W. Greening, Dudley, Golden Russett, Wolf River, Jonathan, Ben Davis, Talman Sweet, York Imperial, King, Delicious, Steele Red, Prior Red, King David, Akin, McIntosh. Complete, modern packing plant in connection. Orchards and plant fully equipped. Must be sold to settle estate. Address Trust Department, Old Merchants National Bank & Trust Company, Battle Creek, Mich. 7

BEES

BEES FOR ORCHARD POLLINATION. WRITE for full information and list of reliable shippers of bees and Orchard packages. We have nothing to sell. Sent free, with sample copy. Beekeepers Item, Box 338, San Antonio, Texas. tf

DAIRY CALVES

FOR HOLSTEIN OR GUERNSEY HEIFER Calves write Edgewood Farms, B-3, Whitewater, Wis.

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BARGAIN. HUNTING AND ALL KINDS OF dogs, also puppies. Burdofts Kennel, Box 389, Morgantown, W. Va. 8x

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WE SELL ON THE CREDIT PLAN. BEST VARIeties. Apple, Peach trees low as 5c; Grapevines 3c; Shrubs 10c; Evergreens 25c. Seeds, bulbs, etc. Benton County Nursery, Box 501, Rogers, Ark. 10-3x

PEACH AND APPLE TREES 5c AND UP. Yellow and Blood Red Delicious. Grapevines 3c. Plums, pears, cherries, nuts, berries, pecans, Ornamentals. FREE catalog. Tennessee Nursery Company, Box 101, Cleveland, Tenn. 10-1x

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CABBAGE PLANTS. LEADING VARIETIES. Best strains. Express: 1,000, $1.00; 10,000, $7.50. Postpaid: 200, 60c; 500, $1.00. Tomato, express: 1,000, $1.85. Postpaid: 100, 65c; 500, $2.35. Catalog. Buckeye Farms, Box C541, Youngstown, Ohio. 7

RASPBERRY PLANTS

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GOLD-LEAF — GUARANTEED CHEWING OR Smoking, 5 lbs. $1.00; ten $1.50. Pipe free. Pay postmaster. CO-OPERATIVE FARMERS, B19, Sedalia, Ky. 7

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XUM

Pages 1-2 Missing

December Suggestions

Prune Apple Trees for Best Fruit

Pruning must be considered an essential part of the orchard management and a big factor in the economical production of marketable apples.

"We know, of course, that pruning influences the shape of the apple tree and aids in the development of a well-balanced top which will produce uniform fruit," says H. R. Niswonger, extension horticulturist at North Carolina State College. "After the young trees reach maturity, it is necessary to continue light pruning so as to maintain this balanced top and to even the distribution of fruit spurs or the fruiting area. Pruning also increases the size and color of apples on trees that are too thick to permit the free circulation of light and air. The better control of fruit pests may be secured by proper pruning."

The North Carolina experiment station has conducted some interesting tests contrasting heavy and light pruning and in general has found that it does not pay to prune too heavily after the shape of the tree has been formed. The light pruning consists largely of a light thinning of the branches with a minimum of heading back. Heavy cutting back and excessive thinning, results in an abundance of water sprouts, delays the formation of fruit buds and reduces the size of the tree.

Mr. Niswonger says, therefore, the amount of pruning needed after a tree begins to bear fruit or after the first years of heavy production will be governed by the size and color of the fruit and the amount of terminal growth. If the terminal growth has been reduced by this heavy production and the fruit has lost color and size, a heavy thinning is needed. This will prevent the tree becoming a bearer every two years.

Peach Leaf Curl

Peach leaf curl causes a loss to peach growers in all sections of Arkansas yearly. Good dormant spraying has held it under control in most commercial orchards, although it usually shows up in poorly cared for home orchards.

Cool, damp spring weather is ideal for leaf curl. Since weather is an important part it is rather misleading. If little or no rain occurs when the buds are swelling and the leaves are unfolding the disease will not be serious. Once the disease has started to develop spraying will not control it, nor can the spray be delayed until the bud and leaf growth starts, declares William G. Amstein, Extension horticulturist, University of Arkansas College of Agriculture.

Diseased leaves as they unfold are reddened, thickened, and much distorted as they develop. The entire leaf crop may be injured. As the leaves attain their growth they gradually dry up and fall off. This loss in foliage is followed by a new crop of leaves. If the disease is severe the fruit is lost and due to lowered vitality the bud crop is cut short for the next season. If the disease is present several years in succession the trees will be seriously weakened. Annual spraying is the best safeguard against the disease.

Only one application of spray is needed to control curl but this must be applied thoroughly. Every bud must be covered and all cracks and crevices reached with the spray. Fall spraying is as satisfactory as spring spraying, and the application may be made any time after leaf fall. Spring spraying should be completed before the buds swell. It is a waste of time and material in attempting to control leaf curl after the disease shows up.

Lime sulphur or Bordeaux mixture will control leaf curl. Oil sprays will not control leaf curl. If lime sulphur is used as a scale and curl spray it should be at the rate of one gallon of concentrated lime sulphur to seven gallons of water. A 4-4-50 Bordeaux mixture will control the leaf curl and the scale can be controlled in the same application if enough oil emulsion to make a three per cent oil is added.

Increase Oil in San Jose Control Mixture

The standard dormant spray formula for peaches to control San Jose Scale and peach leaf curl is a 2 per cent oil-emulsion in a standard 4-4-50 Bordeaux mixture. Due to variations in the strength of the oil used in making the oil emulsion and the reduction in its effectiveness of the presence of the Bordeaux mixture, the per cent of scale control has been reduced in some cases. In dormant spraying this would make it desirable to increase the oil content up to 2½ to 3 per cent whenever full strength Bordeaux mixture is used with it. This should overcome the ability of the Bordeaux mixture to absorb part of the oil and prevent its penetrating the insect, states William G. Amstein, Extension horticulturist, University of Arkansas College of Agriculture.

In purchasing oil for manufacture into oil-emulsion care in securing a satisfactory quality will avoid later disappointment. Red engine oil or oil of similar grade of either asphaltum or paraffin base with a viscosity of at least 125 seconds, Saybolt, at 100 degrees F., and a volatility (loss for four hours at 105 degrees C.) of not more than 1.75 per cent should be used. If miscible oils or other proprietary materials are used the manufacturer's directions should be followed.

Urges Better Packing

Florida fruit and vegetable growers annually lost millions of dollars due to indifferent grading, careless packing and storing of products that are shipped out of the state, M. R. Ensign, truck horticulturist with the Florida Experiment Station, explained in a recent radio address.

In the face of keen competition from within the state, from other states, and from foreign shipments, he urged that it is no longer profitable to offer inferior grades. Uniformity is a cardinal principle of successful marketing today, he said.

Growers who grade for high quality produce and then use ill-adapted containers also invite disaster. The container in which produce is shipped must provide ventilation, it must be strong yet easy to handle, and must show the product to good advantage. One of the chief causes of breakage and heavy loss to the growers is the bulge pack, he explained, giving figures showing that 40 per cent of the packages carrying over 20 per cent more produce than the billing weight calls for arrive at market in a broken condition. The grower does not receive pay for the extra produce in the bulge pack, yet it is the cause of many broken crates and thus a heavy loss.

There are three types of crates that come up to the requirements of a good crate, Mr. Ensign said. These are sturdy, wire-bound crates that are easily assembled without the use of nails. They are made in bushel, 1½ bushel and 2⅓ bushel sizes.

He also pointed to the loose load in the car causing much loss to fruit and vegetable growers. The strongest of crates cannot resist the jolting they will get in a fast moving loosely packed car, while cars of eggs packed in fragile crates, properly loaded on the same trains sustain very little breakage.

Apple Growers Meet

Over 200 apple growers sat in and attended the extension program held in connection with the Fruit Belt Apple Show at Bangor, Mich., which embraced the following items of interest. On this program from M. S. C. we had Glenn L. Ricks on Apple Scab Control and H. D. Hootman on National Conditions Affecting Fruit Growing. G. E. Prater, manager Wolverine Products Association, Grand Rapids, Mich., read a paper on Transportation; Wm. Esslinger, Chief, Fruit and Vegetable Inspection, State Department of Agriculture, read a paper on Closed Packages; Harry D. Garrett, Chief, Chicago Division, U. S. Bureau of Foods and Standards, read a paper on Arenical Residue, the most controversial subject among fruit growers during the past three years. A demonstration on box apple packing was given by Virginia and Western packers, sponsored by H. T. Bigelow & Son, large apple growers. This show is sponsored by the Future Farmers of America of the Bangor High School and backed by the Bangor Chamber of Commerce and stands equal to any fruit show in the state for progressive ideas and educational merit.

One way to cut fruit production costs to meet low prices is to plant one-year trees instead of two-year trees, says Illinois College of Agriculture. One-year trees give as good growth as two-year trees, they are cheaper, and transportation costs are less, the college says.

Winter Work

By F. HAL

EVERY orchard presents problems of its own. Some orchardists feel that clean cultivation is desirable. Others feel that permanent sod is best, while still others feel that a rotation of cover crops and clean cultivation is the best method of handling their soil. It is evident that no one system of orchard management will fit everywhere.

One of the most universal orchard practices is spraying The requirements, or specifications, of the ideal orchard spray outfit are—

1—Gets spray on trees when needed regardless of soil conditions, i.e., not to be handicapped by mud, sand, grades.

2—Of sufficient size (or capacity) to spray entire orchard at the time when spray will be most effective.

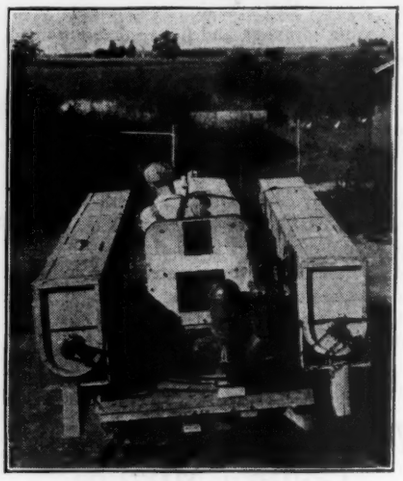
3—Dependable and economical to operate.

4—Low cost consistent with work done; i.e., attainment of above three items.

If low cost is placed first, and due to lack of capacity or ability to work on all types of soil, the spray is not applied properly or at the right time, the outfit would likely prove a poor investment even if it was secured for nothing.

The size sprayer which any size of tractor will handle depends upon the weight or size of the sprayer when full, grades or hills, soil type, moisture condition, and, if power take off driven, the size of the pump and pressure maintained.

The power take-off drive to the sprayer pump should not stop when the tractor's forward motion is stopped. By merely releasing the two steering clutches, the forward motion of the tractor is stopped, but the power take-off keeps right on running. Thus in traveling through the orchard a constant pressure on the pump, or a constant R.P.M. of the blower on a duster, can be maintained and yet the tractor can be started and stopped at will. Formerly this was one of the greatest handicaps to power take-off driven outfits. Every time the tractor stopped to allow the operators to catch up and every time the tractor was started up again, the power to the pump stopped and the pressure was lost. For a good job of thorough spraying or dusting a constant pressure must be maintained at all times.



Spray tanks mounted on sides of a tractor.

It is possible to quite accurately predict the size tractor needed to operate a power take-off driven sprayer provided the size of the sprayer, type of soil and grades encountered are known. Would you like to see how we work such a problem? We will use the outfit pictured here for an example —300 gallon sprayer delivering 24 gallons per minute at 350 pounds pressure. To secure the horsepower necessary to operate this pump, we use the formula—

> Pounds pressure multiplied by gallons per minute, minus horsepower required to drive pump, divided by 870.

In this formula we are assuming that the sprayer pump is 50 per cent efficient. This is a fairly safe margin if the pump is in average operating condition. Some pumps operate at efficiencies over 70 per cent. As an example:

> 350 (pounds pressure) multiplied by 24 (gal. per min.) equals 8400.
> 8400 divided by 870 equals 9.6 horsepower to drive pump.

Thus 9.6 horsepower will be required to operate the pump, this power coming directly from the tractor engine through the power take-off.

Assuming that this orchard is cultivated at least during some of the time when spraying must be done, or that it will be muddy, we will assume that a drawbar pull on the sprayer equal to 20 per cent of its weight will be necessary to move it when loaded on level soil. The sprayer, when fully loaded with spray liquid, weighs 5,500 lbs. Therefore—

> 5,500 lbs. (wt. of spray rig) multiplied by 20 per cent equals 1,100 lbs. draft.

To secure the horsepower required to deliver 1,100 pounds pull, we use the formula—

> 375 divided by M.P.H. equals pounds pull per horsepower.

If low gear, or 2 M.P.H. is used, the pounds pull per horsepower would be—

> 375 divided by 2 or 187.5 pounds per horsepower. Since 187.5 pounds pull equals 1 H.P., then 1,100 divided by 187.5 equals approximately 6 horsepower.

Size of tractor to operate sprayer—operating at first gear speed, or at 2 M.P.H.—to drive pump, 9.6 H.P.—to pull sprayer 6 H.P.—total 15.6 H.P. If the sprayer is to be handled in second gear at 2.6 miles per hour, the horsepower required would be 17.3—9.6 H.P. for the pump and 7.7 H.P. to pull the sprayer. It thus appears as though the sprayer would prove to be some-

Filling one of the spray rigs at the mixing plant on the Senator John T. Townsend farm in Delaware.

in the Orchards

HIGGINS

what too large a load for the 15 H.P. tractor. However, since the 6 horsepower theoretically required to pull the sprayer in low gear, and the 50 per cent efficiency of the sprayer are both estimates, we would recommend a careful survey of local conditions which will include the study of grades, the power required to operate tillage machinery, a study of the weight of the sprayer, size of wheels, etc.

If grades of any consequence, that is, over 4 or 5 per cent are encountered in an orchard, it will likely be necessary to use the next size larger, or the 20 horsepower tractor, for in our calculations we have not included the pulling of the sprayer up grades. For example—if there was a grade of 10 per cent, we would increase our drawbar pull by 10 per cent of the weight of the sprayer, or 550 pounds, in addition to the amount equal to 10 per cent of the weight of the tractor.

There are many uses for tractors in orchards aside from spraying and cultivating. One of the most general uses is that of collecting brush or prunings. A hand-operated type of tractor-mounted brush rake is available to be lifted by engine power and hydraulic pump, which lifts the brush clear from the ground so as not to damage cover crops and deposits its load directly into the brush pile or fire. The tractor pulls sleds or wagons for hauling brush or pulls the portable brush burner.

Another quite common use for tractors in orchards is the pulling of trees of the wrong variety or pulling unhealthy or old trees to make way for a new orchard. Generally, it is more economical to pull out trees before cutting them down as one may use the trunk as a lever, hooking well up on the main branches with a cable or chain, pulling the tree over and then, if necessary, twisting around to yank out the roots. Even the fifteen horsepower "Caterpillar" is able to do this type of work on a direct pull in most cases, and in the case of large trees, we often use a drum, a winch, or block and tackle. Even special buzz saws are available for cutting tree limbs, larger prunings, or other odd wood that may be thereby turned into source of profit.

Tractors in orchards also are used for pulling wagons or sleds with loads of fruit, oil for orchard heaters, props or empty boxes. It is particularly important that positive traction be available for handling loaded wagons, or for helping trucks out of the orchard in the event they become stuck in sandy spots or in mud following a rain.

The selection of an orchard tractor should be considered very carefully and the size and type tractor chosen that will pull efficient widths of implements in the year 'round program, and furnish sufficient power to operate whatever sprayer is required to do the work on time. Furthermore, in selecting a tractor consider (1) the width of tree rows and determine how deep it is desired to cultivate or disk if that is the main job, then (2) choose the right width implement to cover in one or more trips, and in the time allowable for the job, the entire row with no large amount of overlapping, then (3) choose the right size tractor to pull this width implement. Thus, the mileage is reduced in the orchard, thereby reducing the cost of operation. Of course, the selecting of a tractor is not only governed by the width of implement to be pulled on level ground, but the grades to be encountered in the orchard, as well as the type of soil. In many steep hillside orchards, we find the hillside special tractors being used and likewise in many low-growing orchards other special models are used. At present with the wide selection of sizes, models and types available, no matter what the orchardist's condition, he can choose a machine which best fits his needs.

Tractor drawn sled hauls the beehives to winter quarters.

Lower Citrus Costs Reported

A reduction of $47.41 an acre in the cultural costs of producing oranges in California last year, brought the cost down to $226.08 per acre up to picking, according to the California Citrus League, reporting the results of a cost survey. Costs last year, it is stated, were most nearly comparable to those in 1924, and with the exception of that year it is necessary to go back to 1920 to find a lower expenditure. The 1931 yield was comparatively heavy so that per box costs were the lowest since 1920. Reductions occurred in practically all cost items, particularly on fertilizer, soil handling, and pest control. Cultural costs per packed box are reported at $1.813; handling costs, including picking, hauling and packing, at .732 cents; selling and advertising, .130 cents. The total f.o.b. cost, including selling, was $2.675 per packed box.

Marginal Fruit Trees Cut Orchard Profits

Just as marginal farm lands reduce profits when such lands are cultivated so do marginal fruit trees cut orchard profits when permitted to remain in the orchard.

"This is especially true of commercial apple orchards," says H. R. Niswonger, extension horticulturist of North Carolina. "In nearly every such orchard there are non-profitable trees which are no longer returning the cost of fruit production. They are being nursed along at the expense of the more profitable trees and should be consigned to the brush pile and replaced with new ones. Non-profitable trees are those damaged beyond recovery by the root rot disease, woolly or root aphis, crown gall or fild mice. Odd varieties or low quality seedlings may also be considered non-profitable. In some instances, the latter trees may be top-worked to the more popular commercial varieties."

The present trend in apple prices makes it necessary, however, for the fruit grower to lower his unit cost of production and he cannot do this as long as he has to nurse along a bunch of non-profitable trees. Removing these from the orchard will help to reduce the cost of producing fruit. A good time to do this is during the pruning season which is now approaching.

However, it is not wise to set young and better trees in place of those removed if the subsoil is shallow. It is better to leave a vacancy in that part of the row. If the root rot disease or woolly aphis were present where the old trees stood, all the roots within an area of several feet should be removed before a new tree is set. The hole should also be filled with rich dirt taken from a field that has been in cultivation for a long time. Tobacco stems and leaves mixed with this new soil will protect the trees against damage from the woolly aphis.

EDITORIAL PAGE

The Old Year and the New

WE NOW come to the end of the year. It has been a difficult one, not only for the members of the fruit growing and marketing industry, but for all of us. But, some good has come of it. More people have formed the fruit eating habit.

For a number of years, during most of which fruit prices were high, people were urged to eat fruit. We had "orange weeks," and "apple weeks;" which were widely advertised. These promotion plans and ideas moved through retail channels enormous quantities of orchard products at good prices, and often at high prices.

With the coming during the last three years, and especially in 1932, of much lower prices than buyers were accustomed to pay, those asked now seem to put fruits in the bargain class, with consequent heavy buying.

Undoubtedly the fruit industry will profit in the long run from our so-called depression. Also, necessity will probably teach us a lot of things about economical production.

One of these lessons will be that no matter what other sacrifice may be necessary, it is not economy to neglect the trees and bushes. Good cultural practices, spraying and pruning, and careful grading and marketing are essentials if the fruit grower is to stay in business. There is no place in the markets for second grade fruits, especially now. And the producer of first grade fruits is going to get the best prices.

Spraying

IT IS about the time of dormant spraying and pruning. There is much work to be done in the orchards, especially in the colder sections of the country. Men, generally called scientists, are constantly discovering new methods of combating the enemies of fruit growers. New and improved spray materials are being discovered, which will make fruit growing less hazardous.

There is no general plan of spraying that is applicable to all sections—each state and locality present problems of their own. The men who know what is best in their sections are those connected with the state colleges and extension divisions of the colleges.

Whatever your problem, these men are ready to help. Do not hesitate to consult them. Their job is to help you, and it is through the questions you ask and the troubles you may encounter that they find out the answers which help the industry as a whole.

In this issue there is an exceptionally helpful article on winter work in the orchard. Mr. Higgins has touched on a number of important things, many of which all fruit growers know, but may be benefited by recalling them to mind. We cannot help but recommend a careful reading of his article, which begins on page 4.

"We Want Your Help"

YOU MAY have noticed in the last issue of AMERICAN FRUIT GROWER the item under the heading, "We Want Your Help." It read as follows:

"If you move, write us at once, giving your old and new address. This will enable us to send AMERICAN FRUIT GROWER to your new address, and will insure your getting it promptly. Do not delay. Send your old and your new address to AMERICAN FRUIT GROWER, 1105 Merchandise Mart, Chicago, Ill."

Some explanation of this request may be in order.

When you move and notify your postmaster of a change of address, the first issue of AMERICAN FRUIT GROWER received at your old address, is forwarded to you. At the same time the postmaster notifies AMERICAN FRUIT GROWER of the change in your address.

Until July 1, 1932, this notice was sent free. Now there is a 2-cent charge for each one. This may seem small, but when several thousand subscribers move each year it runs into a considerable sum, which would be saved if you, as a reader of AMERICAN FRUIT GROWER would *notify us* as well as the postmaster of your change of address.

XUM

Crop Comments

Fruit production is but little changed from the early indications. An increase of nearly 4 per cent is indicated in the total apple crop, which was benefited materially by the October rains increasing the size of the fruits in the eastern and central producing areas. The change in the total pear and grape crops was insignificant. The indications or the citrus crop in Florida remained unchanged. The preliminary estimate of cranberry production showed about a 1 per cent decline from the expectations. The decline was due entirely to the disappointing yields being obtained in Washington and Oregon where freeze damage and small sizes reduced prospects.

Of the fruits, principal interest now lies in the apple crop, the total production of which in 1932 is placed at 138,976,000 bushels. This is about 31 per cent smaller than the large crop of last year, about 10 per cent smaller than the crop of 1930 but about 4 per cent larger than the crop of 1929. The commercial crop in 1932 is now estimated at 28,385,000 *barrels* or 85,155,000 bushels, which is about 18 per cent less than the commercial crop of 1931.

In years of small crop, such as the present, quality is usually below average. During the past season this has been accentuated by lack of funds in many sections to follow a complete spray program.

The farm price of apples on October 15 was the lowest recorded since 1914. This, together with the low quality, would ordinarily be expected to result in a heavy abandonment of fruit and consequent reduction in the commercial crop, but on the contrary, there is evidence of an unusually close utilization of the present crop for shipment as fresh fruit. This is noted particularly in some of the eastern and central producing centers readily accessible by truck to the larger cities and the smaller manufacturing and mining towns. The reason is apparently to be found in the relative as well as the actual price of apples and in the transportation factor.

The only states for which an indication of citrus production during the 1932-33 season is available are Florida, Texas and Louisiana. In these states the combined production of oranges and grapefruit now promises to be somewhat short of the 1931-32 crop and considerably smaller than the large production in 1930-31.

In Florida the total orange crop is expected to amount to around 14,300,000 boxes or about 3.5 per cent more than last year, and the commercial or shipping crop is indicated at 11,800,000 boxes or about 5 per cent more than the 11,200,000 boxes shipped during the 1931-32 season. The Texas crop is expected to be around 500,000 boxes as compared with 520,000 last year. Louisiana has about 241,000 boxes of oranges in prospect for the coming season as compared with 245,000 last year.

Total grapefruit production for the 1932-33 season in Florida is still indicated at 9,200,000 boxes or close to 10 per cent less than the 1931-32 crop of 10,200,000 boxes. The commercial crop in Florida is placed at 6,700,000 boxes or about 13 per cent less than produced a year ago. In Texas the 1932-33 grapefruit crop is indicated on November 1 at 1,350,000 boxes which is only a little more than half as large as the production during the season just past.

Apple Week Observed

The Washington Boxed Apple Bureau this year sponsored National Apple Week from October 31 to November 6 with a special drive among the trade on Jonathan and Delicious apples and with observance of the event in various cities with co-operation of the local fruit trade.

In Seattle on October 29 Apple Week was inaugurated with the world's largest apple-bobbing contest. The surface of the swimming pool in the Washington Athletic Club was entirely covered with apples, 250 boxes being used. About 150 youngsters then went into the pool and bobbed for the apples.

The event was photographed by News Reel Services and photos were sent to the National Photographic services. A wide publication of the photos has already been made in the Northwest.

"I'll call you when they come in"

A MISSOURI FARMER was ready to buy a flock of sheep. He had the grass and the hay. Prices were dirt cheap. It was only a question of striking the market on a day when a good flock of ewes had come in from the west.

But instead of taking a chance and probably wasting a day, he telephoned a commission firm. There were no good ewes in that day—not the kind he wanted to buy. But they would call him.

Three days later the telephone rang at five in the morning. Three carloads of ewes from Idaho had arrived in the night—three-quarter Rambouillet that probably averaged 130 pounds. Just what he wanted, and they'd sell for about two and a half cents!

He got his sheep—without wasting four days hanging around the yards. By telephone he was able to learn just when he should be there.

Use the telephone. It will put you in touch with the right place at the right time. Save time and trouble. Help you get better prices by bringing the latest market quotations before you sell. Make farm life easier and more pleasant. And all it costs is a few cents a day.

A BELL SYSTEM ADVERTISEMENT

Pneumatic Tractor Tires

ONE of the most outstanding developments in the tractor industry is the announcement of several manufacturers that their machines may now be equipped with pneumatic tires for both field work and for driving on improved roads. Orchardists who use tractors will be interested in this development, as many of them use tractors for hauling trailers to shipping points, as well as for discing their orchards and turning under cover crops.

This new development in pneumatic tires for tractors has been made by several of the foremost makers of automobile tires. The tractor tires are of special construction, and are inflated to only twelve pounds pressure. With this low air pressure, the tires bend and bulge in the side walls under the load more than tires on cars and trucks.

Some of the claims of the makers for this new type of tractor wheel are:

Inflated to only twelve pounds, these new tires release for productive effort more than 75% of the power required to move a steel wheel and lug equipped tractor—an actual gain in power at the drawbar of seven to eight horse power.

That extra power makes a three plow tractor out of a two plow tractor or speeds up the work by 50% if the extra plow is not used. Instead of "plodding" along, the pneumatic tired tractor steps out briskly and gets the job done in much less time.

The big air cushions with large ground contact and sure-footed non-skid grip will eliminate much jerking and unevenness and improve the quality of the work of the implements. Steering is easier with pneumatic tires.

The riding comfort of the pneumatic tires is going to take out of tractor operation the back-breaking jolts and twists—no more standing up to ease tired backs and no more aching legs from hours of constant standing.

Because the pneumatic tired tractor is faster and more adaptable, it will fit into more farm operations than the steel wheel tractor—on the roads, over the yard, into the buildings, anywhere without cutting up the surface over which it passes.

No changing of lugs or applying of overtires is necessary with pneumatic tires. They are ready to go any time on any job.

Cushioned by the pneumatic tires, the life of the tractor will be increased; lessened vibration of and strain on moving parts and gears will reduce breakage and repairs.

More power and speed made available by using pneumatic tires mean more work done with less fuel and oil expense. Lower engine speed and cooler operation will save real dollars and cents in operating costs.

The ability to operate in the fields on all operations for which tractors on steel wheels are used and in addition the ability to operate into buildings, over the roads, etc., make the tractor equipped with tractor tires the all-around power unit the farmer wants.

Farm tractor equipped with low pressure pneumatic tires.

Tells How to Grow Grapes in New York

While it may seem a little early to talk about grape culture with the past season scarcely out of the way, yet the perennial interest in grape growing prompts a look ahead to next season, especially for those who may be planning to set out a new vineyard. In this connection the State Experiment Station at Geneva is calling attention to a pamphlet which is described as the ABC of grape growing in New York. Prof. F. C. Gladwin, for many years in charge of the Vineyard Laboratory maintained by the Experiment Station at Fredonia, is the author of the circular, and while Prof. Gladwin does not pretend to give a complete account of grape growing in the 10 pages of this pamphlet, he does set forth the essentials as a guide to the prospective grower.

Beginning with the selection of the vineyard site and the preparation of the soil, Prof. Gladwin gives directions for the selection of the vines, their planting, and subsequent care. The matter of tillage and the use of manure and fertilizer is briefly noted.

In speaking of varieties, Prof. Gladwin warns against going to extremes in planting too many varieties unless markets are definitely assured. He lists a number of possibilities, including some of the newer kinds, and also discusses the need for proper pollination to insure satisfactory setting of fruit.

"Grape Culture in New York" is the title of the pamphlet which is designated as Circular No. 110. It may be obtained free of charge by addressing a post card to the Experiment Station at Geneva.

Gypsy Moth Eradicated

The gypsy moth has been eradicated from New Jersey. This insect infested more than 400 square miles in New Jersey and it required about ten years to exterminate it. No trace of the moth has been found in New Jersey since May, 1929, and the extermination is now considered complete. The success of this work, Mr. Strong says, conclusively demonstrates the soundness of the methods employed and showed that it is entirely feasible to eradicate this insect from large areas when work is undertaken vigorously, with trained personnel and with sufficient funds. The Federal Government and the Department of Conservation of the State of New York are now co-operating to eradicate this pest from Long Island.

79 Million for California Citrus Fruit Growers

Returns of $79,000,000 for 79,066 carloads of oranges, lemons and grapefruit are reported for the year ended October 31, by Paul S. Armstrong, general manager of the California Fruit Growers Exchange. This return of $1,000 per car average for a large crop is ample evidence of the benefits of the years of organization and co-operative marketing efforts that stand behind the California citrus industry.

The Exchange alone marketed 58,201 carloads and returned to Sunkist shippers, f.o.b. packing house, $59,856,459. The delivered carload value of the California and Arizona citrus crop was $121,634,504, of which $42,413,752 went for freight and refrigeration. Orange shipments from the two states were 62,222 cars, lemons 14,529 cars and grapefruit 2,315 cars. Exchange shipments equaled 43,770 cars of oranges, 12,776 cars of lemons and 1,665 cars of grapefruit, a total of 58,201 cars or 73.6

per cent of the total shipments. These figures represent packed fruit only and do not include loose fruit sales or by-products fruit, which would increase the Exchange percentage, according to the report.

Approximately 143,000 carloads of citrus fruit from all sources were sold in the American market during the year—a volume exceeded only in 1929 and 1931, when comparable figures in round numbers were 158,000 and 170,000 carloads. Exchange shipments of 58,201 carloads were greater than in any year in the past with the exception of the same two seasons.

Texas Battles Fruit Fly

The Mexican fruit fly in the lower Rio Grande Valley of Texas required special attention last year. More of these flies were discovered there in the late winter and early spring of 1932 than in previous seasons. The infestations were still too light to cause direct damage of economic importance but they were scattered throughout the lengh of the valley. Suppressive measures included the elimination of summer host fruits (which had been the regular practice for the last five years); a poison bait spray to kill adult fruit flies in summer; and the prevention of spread through special restrictions on the shipment of susceptible fruit. The department is co-operating with Mexico in the suppression of this insect on both sides of the Rio Grande.

1932-33 Citrus Crop in Florida Forecast

Government estimate of the Florida citrus fruit crop places the commercial production for 1932-33 at 18,500,000 boxes, of which 6,700,000 are grapefruit and 11,800,000 oranges and tangerines. This covers the crop to move by rail and boat, including express shipments but not fruit trucked or fruit for canning, juice extraction and home consumption. These figures are 12.7 per cent less than the October estimate last year on oranges and tangerines, and on grapefruit 21.2 per cent less.

Total production, however, is estimated at 23,500,000 boxes, of which 9,200,000 are grapefruit and 14,300,000 oranges and tangerines. This covers fruit to be utilized in any way.

Study Export Fruit

To find the most effective methods of shipping apples and pears to foreign markets, the United States Department of Agriculture has made test shipments and observed their handling all the way from Pacific Northwest orchards to ships and then to British markets.

The department expects its observations to be especially valuable to exporters and also to the ship companies. Frequently when fruit arrives abroad in a spoiled condition, exporters blame the ship companies for careless handling, while the companies often contend that the fruit was in poor condition when shipped. The department made two test shipments last year and is continuing the investigations this year.

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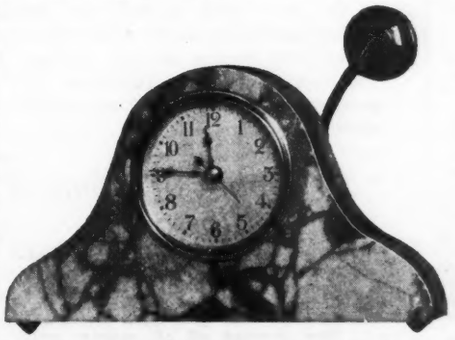

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QUESTIONS AND COMMENT

CONDUCTED BY T. J. TALBERT

Questions on fruit growing problems and on general horticulture will be answered through this department if of general interest. For reply by mail enclose 3c stamped envelope (air mail 8c). Address AMERICAN FRUIT GROWER, Merchandise Mart, Chicago.

Storage Bins for Apples

I would appreciate it if you will give me details as to how to construct storage bins for my apples. I have a good cool concrete basement in which there is no heat of any kind but deep in the ground where there is no possibility of freezing. The basement is small and I would like to store the maximum amount in a minimum space with, of course, the proper arrangement for circulation and ready access to the bins in handling the fruit. The varieties I desire to store are largely Golden and Red Delicious.—F. R. C., West Virginia.

Storage bins in your concrete basement may be constructed by building a framework consisting of shelves one arranged above the other with sufficient capacity or height to allow the placing of a box or basket of apples. Two tiers or shelves may be placed within about eight or 10 inches of each other and a passageway left between each two rows or tiers. With such an arrangement as many tiers of shelves may be constructed as needed. Through such construction and arrangement, it is believed that good ventilation is provided.

Borer Control

Received the book, "Profitable Answers to Problems in Fruit Growing." Wish to ask your advice in regard to repellent washes for fruit tree trunks, pages 115-116. Would you advise this formula—Hydrated lime, coarse salt, arsenate of lead, and in what proportion to make 50 gallons?

Referring to pages 74 and 75 on peach tree borers, I have used this method very successfully on peach trees, covering the mound with a water-proof paper and leaving it all winter. The mound is placed September 1 and removed the latter part of March.

At this time these borers are working high up on the trunks of Black Tartarian cherry trees. It is practically impossible to use the ground method the same as used on peach trees.

The following from the "Grand Rapids Sun," November 20, 1930: "Paradichlorobenzene crystals dissolved in crude cottonseed oil, paraffin, grafting wax, or any highly penetrative solvent, painted on the bark around the burrows of the peach tree borers."

Would you advise raw or boiled linseed oil? Which would be the best penetrative solvent? Kindly give the proportions used and amount of P. D. B. Would this be okeh for cherry trees as well as peach trees? —F. L. S., Michigan.

One of the most conveneint repellent washes at present used extensively or on a commercial scale to prevent attacks of borers on fruit trees and to lessen injury by sun-scald is as follows: Use five to seven pounds of unslaked stone lime or eight to 10 pounds hydrated lime to 50 gallons of water. Add to this about two pounds arsenate of lead. It is important that the mixture be strained thoroughly to prevent nozzle clogging. The repellent wash or spray may be used in the regular orchard spray outfit and the operator can spray the trunks of the trees very rapidly.

Since the paradichlorobenzene treatment may do injury to the cherries, or, in fact, any other fruit tree except the peach, it would be advisable to employ the repellent wash mentioned above for your cherry trees as well as apple trees.

The formula which you give, including P. D. B. crystals dissolved in crude cottonseed oil, paraffin, grafting wax, etc., may be entirely satisfactory. You should keep this in mind, however, that any penetrative solvent such as you mention may be harmful to the trees.

The raw linseed oil is always preferred to the boiled linseed oil in preparing paints or washes for the trunks of fruit trees, as the raw product is less likely to do injury.

Strawberry Grubs

Is there anything that could be done late this fall or before the ground freezes in order to free a strawberry bed from grubs for next year? Of course, I have my berry patch on the same ground all the time so I can irrigate it. I hoe out the old plants and save the young runners every season. I have never encountered any trouble worth mentioning, excepting this summer when they destroyed better than two-thirds of my patch.—W. K., Nebraska.

Perhaps the most effective and practical means of preventing injury from white grubs in your strawberry patch next year will consist of plowing or stirring the soil in the berry patch as deeply as possible during late fall or early winter this year.

For your section it will perhaps be necessary to mulch the berries as soon as practical after the last cultivation or plowing.

Dropping of Tomato Blossoms

Last year the blossoms of my tomatoes dropped off and the tomatoes wouldn't set. They kept that up until the beginning of August, then they all set. This year they are worse. They dropped off all summer until the beginning of September, then they all began to set. Some people say the soil is too rich, while others insist it is a lack of nitrogen in the soil. I think it is caused by the season. The vines are four and five feet tall, healthy as can be, with no sign of blight or wilt. New Globe is my favorite.—W. K., Nebraska.

From the description which you give of your tomato plants, it is our thought that the principal cause of the dropping of the flowers has been due to drought conditions of last year and of this year. If it is possible, therefore, to irrigate or if more rainfall is received, you are likely to have a better set of fruit and greater yields. Moreover, as you suggest, in all probability the soil has a sufficient supply of nitrogen and you do not need additional fertility for crop yields but you do need more moisture.

The Youngberry and Loganberry

Wish you would give me a description of the Youngberry, how the vines grow, upright or if they lie on the ground; also color of berry. I should also like information on the Loganberry.—N. B. P., Illinois.

The Youngberry is a very vigorous strong grower and trails on the ground in its growth unless the canes are tied up and supported by some sort of trellis. In fact, trellising is necessary for the best yields.

Since the Youngberry is fairly tender to cold, particularly where zero temperatures or lower are experienced, it is generally advisable to lay the vines down on the ground in the late fall or early winter and cover them with clean wheat straw to the depth of two and one-half to three inches.

In the spring the vines should be lifted and tied to a trellis in a manner similar to grape vines which have been pruned and trained to the fan system. All weak vines should be removed at this time and, where there are too many canes, thinning may be practiced to good advantage. Perhaps not more than five to seven good canes should be left and trained upon the trellis. It is also advisable after harvest to remove all the old fruiting canes as in the case of blackberries and raspberries.

The Loganberry was originated by Judge J. H. Logan of Santa Cruz, Calif. It is the result of a cross between the Aughinbaugh, a variety of Rubus vitifolius, a wild blackberry of California, and a red raspberry, probably the red Antwerp. It was a chance hibrid developed from seed in 1881. Since that time the cultivation of the plant has increased extensively. The Loganberry is grown all the way from southern California to British Columbia. While the plant is a very vigorous grower, yet it is very tender to cold and will not succeed where the temperature reaches zero unless protected, and even under protection, does not seem to fruit as heavily as it does where mild winters are experienced.

Dynamiting Ground for Drainage

Please inform me how deep to dynamite ground to dry it. I have a piece of ground in a sag that I can't drain. It has been said it ought to be dynamited 12 or 15 feet deep and I want you to let me know how deep and how far apart.—J. S. J., Ohio.

The depth to which you should dynamite ground for drainage will depend upon the character of the soil and rock formation. In the case of a sandy or gravelly formation at depths of a few feet below the surface, good drainage might be procured through shattering the top soil. On the other hand, if the character of the formation approaches that of a stiff, hard,

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impervious clay, it is possible that dynamiting would be of but little or no value.

The value of dynamiting to drain soils, as you have suggested, may be questioned for most soil and earth formations. This is true because after a year or two at least the clay is likely to come together again and become so compacted that earlier dynamiting may have no effect whatever. If some form of tile drainage or drainage to a fairly deep well or excavation can be provided, it is likely to prove much more effective and worth while than dynamiting the ground as you have suggested.

Uneven Ripening of Grapes—Storage Cellar Construction

Can you tell me why my grapes do not ripen up evenly as do the commercial table grapes, Concords, etc.? With me a few grapes on a bunch ripen at a time, making it impossible to gather presentable bunches.

Please also advise me as to construction of an underground storage cellar for apples. I have an orchard of 400 trees on a mountain side where a cellar could be dug and filled with apples by gravity. Please advise as to what size will be needed and how it should be operated.—A. M. L. G., North Carolina.

The chief reason for grapes ripening unevenly is usually due to a lack of proper nutrition. For example, where drought or semi-drought conditions prevail, grapes do not as a rule ripen as evenly as they do where an ample amount of moisture is received. Over-fertilization may also produce similar results; while a lack of pruning or too much pruning may cause the development of conditions in the nutrition of the vine which may produce uneven ripening.

Regarding the construction of underground storage cellars for apples, it is suggested that you write the United States Department of Agriculture, Office of Information, Washington, D. C., for available publications upon this subject. In such a publication you may get much more detailed information and directions for construction and operation than could possibly be given in a letter of reasonable length.

Soil Moisture

I read your reply to my question with much interest. But I was not convinced regarding the moisture in blue grass sod in midsummer. And I am sure you will appreciate my calling your attention to a statement on page 40 of "Hoosier Horticulture" for March made by R. D. Anthony of Pennsylvania State College that they found at times "as much as 15,000 gallons of water per acre foot more than in plots under cultivation and cover crops."—R. A. O., Indiana.

We do appreciate your calling our attention to the statement in "Hoosier Horticulture."

As to the amount of water in the orchard soil under blue grass as compared with that found in similar soil under cultivation and cover crops, I think we will all admit that the crux of the whole matter depends upon the resulting growth and development of the fruit in the orchard. Generally speaking, cultivation and cover crops not only conserve moisture better when moisture is really needed but also produce healthier and more vigorous trees, although cultivation and cover crops may not always be the best particular practice for the orchard concerned.

Infested Beehives—Comparative Size of Apples

First, if beehives and frames that were infested with foul brood were boiled for an hour or so in formaldehyde would they be safe to use again?

Second, I would like to know about the comparative size of the following apples: Arkansas Black, Red Rome, Starking, Staymared, and Paragon. I want a good apple that will grow large and not have to thin so much. I have ordered all of the above kinds with the exception of Paragon and Arkansas Black.—W. C. H., New Mexico.

Boiling beehive frames for an hour in a formaldehyde solution, as you have suggested, should free them from infection of foul brood.

Of the varieties of apples which you mention, the Staymared generally produces the largest fruits. Following this, the order of size of the fruits of the varieties which you mention is: Starking, Red Rome, Paragon, and Arkansas Black.

Between the varieties Paragon Winesap and Arkansas Black, in general Paragon gives better results and is a more regular bearer than Arkansas Black.

Home-Made Pectin

I have a few bushels of clean, well-dried apple pomace, saved from last year's apple crop, that I would like to extract pectin from this season. Can you tell me how I can construct something by which I can accomplish this result?—M. T. A., Missouri.

You can prepare a very satisfactory home-made pectin by boiling the clean well-dried apple pomace for about 35 to 40 minutes. The juice may then be pressed from the heated pulp and cooled for use.

Alabama, Louisiana Orange Crops Moving

The orange crop of Alabama, estimated at about 450 cars, has begun to move. The fruit is mostly of the Satsuma variety. Sizes will probably run larger than last season as growing conditions have been more favorable.

Louisiana has also begun the movement of its citrus fruit crop, forecast as around 300 to 350 cars in all. Oranges in this section are principally of the Creole variety, and sizes, it is thought, will run 200s and smaller.

Circular on Peach Growing

A 15-page circular just issued by the New York State Experiment Station at Geneva contains the most important things that one should know about peach growing, including the selection of the site, the care of the trees, the choice of varieties, the control of insect pests and diseases, and other helpful information about peaches. A copy of the circular may be obtained free of charge upon request to the station.

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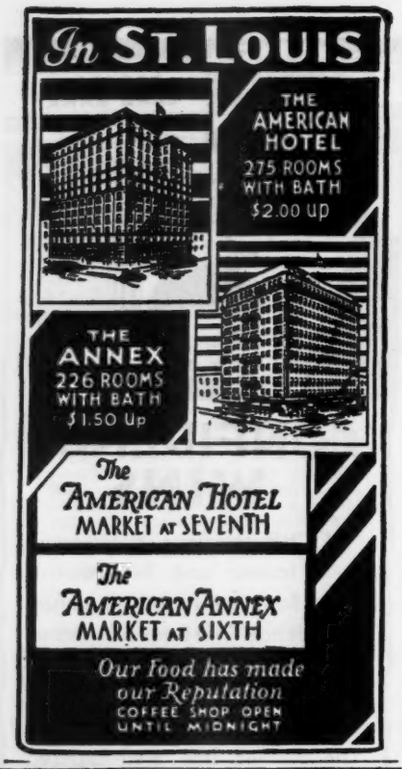

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A whitewash has been made at the Georgia Experiment Station which has proved to stick to the wall and give a white paint resemblance; it is as follows:

50 pounds hydrated lime
10 gallons water
10 pounds salt
2 pounds alum
1 bar soap

Melt the soap and mix these ingredients 24 hours before the whitewash is to be applied. This will give a smoother whitewash and will also stick better than if used right after being made. The alum and salt are used to lend adhesiveness and prevent rain and water from flaking the wash off. Soap is added to give a gloss, as is found in oil paint. After setting for 24 hours enough water is added to the solution to give it a consistency of thin cream. This can then be applied either with a spray or brush.

New Fruits Cataloged

The publication of a catalog of new fruits, most of which originated at the New York State Experiment Station at Geneva, has called forth a comment on the need for new fruits by Dr. U. P. Hedrick, director and for many years in charge of the station's fruit breeding work. Because there are no perfect fruits and because all of our present varieties can be improved in many ways, the station has long been interested in the breeding of better varieties of all of the hardy fruits, he says.

Most fruits are better known for their faults than for their good qualities, declares Dr. Hedrick, adding that nearly all kinds can be improved in size, color, shape, texture, flavor and aroma.

The catalog is published by the New York Fruit Testing Co-operative Association, an organization of fruit growers who are interested in trying out the new fruits originated at Geneva. The association works in close co-operation with the station in the propagation of planting stocks of the new fruits which are sold to its members at about cost. The catalog lists 16 new apples, two crab apples, eight cherries, four nectarines, 12 peaches, seven pears, 10 plums, 13 grapes, one elderberry, two gooseberries, two red and two black raspberries, and five strawberries. A copy may be obtained free of charge upon request to the station.

Canada's Apple Crop Less Than Last Year

The commercial apple crop of Canada will total 3,428,500 barrels this year, according to the agricultural department of the Canadian National Railways. By provinces the crop is estimated as follows: Nova Scotia, 1,868,500; New Brunswick, 34,000; Quebec, 173,000; Ontario, 680,000; British Columbia, 4,418,500 boxes. The crop in eastern Canada is below that of last year but it is higher in British Columbia. For the whole of the Dominion, the crop will be about 364,552 barrels less than in 1931.

Other fruit returns for the year in Canada are: Pears, 454,000 bushels or 55,000 more than last year; peaches, 878,500 bushels or about even with 1931; plums and prunes, 245,500 bushels, an increase of 20,000 bushels; grapes, 54,044,000 pounds or 2,680,000 pounds more than last year. The grapes are used largely for the manufacture of wine, an industry that was established in Canada in 1852.

New Raspberries Escape Mosaic

Two new varieties of raspberries, one a red sort and the other a black cap, give considerable promise of aiding in the control of the two most serious mosaic diseases that afflict raspberries, declares Dr. W. H. Rankin, plant disease specialist at the New York State Experiment Station at Geneva, who is making a study of raspberry diseases. The new varieties have been named Newburgh for the red sort and Naples for the black variety.

"Red and yellow mosaic are serious diseases of raspberries in New York and are difficult to control in most of the standard varieties of red and black raspberries," says Dr. Rankin. "In a study of the resistance or the mosaic-escaping ability of certain varieties, several seedlings have been obtained which have remained free from mosaic for four years. Two of these have been named, one a red raspberry called Newburgh and one a black raspberry named Naples.

"The Newburgh has remained free of mosaic in the testing plats for four years, even though surrounded by other varieties and seedlings which have become dwarfed and worthless due to mosaic infection. Newburgh has also been planted by growers in different sections of the state and all reports thus far received show no infection in these plantings.

"Naples has been grown for four years in plats containing other varieties heavily infected by red mosaic and only a few Naples plants have shown the disease. In a planting of about 2,000 Naples only one plant affected by red mosaic was found this year. This new variety seems to escape mosaic infection very definitely."

Both Newburgh and Naples are recommended for trial by the station specialists, not only because of their proved merit as superior varieties of raspberries, but also for their mosaic-escaping qualities.

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Profitable Answers to Problems in Fruit Growing

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Of AMERICAN FRUIT GROWER, published monthly at Chicago, Illinois, for October 1, 1932.

State of Illinois } ss.
County of Cook }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Harry W. Walker, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the AMERICAN FRUIT GROWER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—International Trade Press, Inc., 1105 Merchandise Mart, Chicago, Ill.

Editor—Chester G. Campbell, 1105 Merchandise Mart, Chicago, Ill.

Managing Editor—None.

Business Manager—Harry W. Walker, 1105 Merchandise Mart, Chicago, Ill.

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Joseph E. Browne, 222 N. Bank Drive, Chicago, Ill.

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Harry W. Walker, 222 N. Bank Drive, Chicago, Ill.

E. G. K. Meister, Gates Mills, Ohio.

Chas. W. Price, 110 West 42nd St., Room 514, New York City.

C. A. Tupper, 531 N. Elmwood Ave., Oak Park, Ill.

J. A. Cunningham, 72 W. Adams St., Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

Chicago Trust Co. (Trustee), 134 So. La Salle St., Chicago, Ill.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is ———. (This information is required from daily publications only.)

HARRY W. WALKER,
Business Manager.

Sworn to and subscribed before me this 12th day of October, 1932.

(Seal) A. C. BAMBERGER,
Notary Public.

(My commission expires August 10, 1933.)

A summary of the apple export season, 1931-32, including a brief summary of the pear, plum and grape seasons, as prepared by F. A. Motz, fruit specialist in Europe, has been issued in mimeograph by the federal bureau of agricultural economics.

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Patterns may be secured by mail, postage prepaid, at 15 cents each from FASHION DEPARTMENT, AMERICAN FRUIT GROWER, 200 Fifth Avenue, New York, N. Y. Be sure to state size required. Enclose 10 cents additional for copy of Winter Fashion Magazine (15 cents where no pattern is ordered).

Coming Meetings of Fruit Growers

IDAHO State Horticultural Society meeting will be held at Boise, January 10 to 12, 1933. —**W. H. Wicks, Secretary, Boise.**

MASSACHUSETTS Fruit Growers' Association meeting will be held in the State Armory, Worcester, January 4 to 6, 1933.—**William R. Cole, Secretary, Amherst.**

NEBRASKA State Horticultural Society meeting will be held in Plant Industry Building of College of Agriculture, Lincoln, January 3 to 5, 1933.—**E. H. Hoppert, Secretary, Lincoln.**

NEW YORK State Horticultural Society seventy-eighth annual meeting will be held at Edgerton Park, Rochester, January 11 to 13, 1933. Eighty-five thousand square feet floor space for fruit and commercial exhibits. Three-day speaking program on subjects concerning the apple industry. Banquet for future fruit growers.

Eastern meeting of society will be held in State Armory, Kingston, N. Y., January 25 to 27, 1933. Three-day program. Fruit and commercial exhibits. Banquet for boys.—**Roy P. McPherson, Secretary-Treasurer, LeRoy.**

OKLAHOMA State Horticultural Society winter meeting will be held in Huckings Hotel, Stillwater, January 11, 1933.—**George W. Cochran, Secretary-Treasurer, Stillwater.**

PENNSYLVANIA State Horticultural Association winter meeting will be held in the South Office Building, Harrisburg, January 17 and 18, 1933.—**R. D. Anthony, Acting Secretary, State College.**

Northern Nut Growers' Association meeting will be held at Downingtown, Pa., September 11 to 13, 1933.—**Willard G. Bixby, Secretary, Baldwin, N. Y.**

WEST VIRGINIA Horticultural Society fortieth annual convention will be held in the Market House, Martinsburg, January 25 and 26, 1933. Allied industries will exhibit in same building.—**Carroll R. Miller, Secretary, Martinsburg.**

Avoid Mixed Plantings of Peaches and Late Apples

Oriental fruit moth has spread to such an extent in recent years that anyone planting fruit trees should keep it in mind that mixing or interplanting of peaches and apples which mature later than the Elberta peach should be avoided, states William G. Amstein, extension horticulturist, University of Arkansas College of Agriculture.

The oriental fruit moth spends the spring and summer months on the twigs and fruit of the peach. After peach harvest this insect will feed on apples. By planting varieties that will mature early this apple injury will be cut down. It is better, however, to make the plantings of apples and peaches in separate blocks that are not close enough to each other to allow this insect to damage both blocks.

No effective control of the oriental fruit moth has been developed except cutting down on the number of generations by limiting the number of host crops and thus the feeding range offered by these hosts, Mr. Amstein points out.

Apples Rank First in Canada's Fruit Production

Apples hold first rank among the commercial fruits of Canada and last year accounted for 60 per cent of the total value of the commercial fruit crop of the dominion. At a considerable distance apples were followed by strawberries, peaches, raspberries and grapes, all of which ranked close together in value.

The total value of the commercial fruit production of Canada in 1931 was $14,756,636. This was a reduction of 18 per cent from the value of $18,165,276 in 1930, but, nevertheless, there were increases in the crop of a number of varieties of fruits.

California Says "Advertising Pays"

"Advertising pays," says the Los Angeles Chamber of Commerce agricultural departments, citing "a concrete instance of the value of advertising in increasing the consumption of agricultural products" as shown in a recent survey of the California avocado industry, made by Dr. E. A. Stokdyk of the University of California. During the past season, it is reported that records were kept on sales in 34 cities of the United States before and after advertising effort was spent in these cities, and that the increase in sales after advertising work was from five to 1,000 per cent.

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